

# The MINING CONGRESS JOURNAL

Volume 13

JANUARY, 1927

No. 1

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Discrimination Against Income of Corporations  
Waivers, Credits, and Refunds  
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Efficient Management Helps Solve Problems

Exploration of Prospects  
A Drill Steel Shop on a Factory Basis  
Concrete Shaft Linings  
Use of Concrete in Mine Timbering

## Contributors:

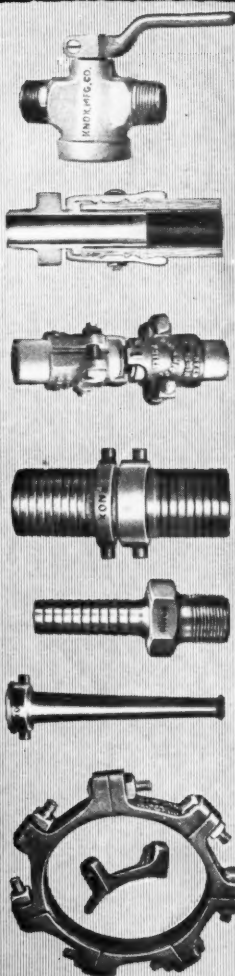
Hon. Herbert Hoover, Hon. James J. Davis, Robert E. Tally, Frank M. Smith, R. C. Allen, Thos. D'A. Brophy, J. W. Ady, Jr., Fred Carrol, J. D. Conover, Harold T. Edgar, Walter Barnum, E. W. Parker, Harry N. Taylor, Eugene McAuliffe, Henry B. Fernald, Walter A. Staub, Charles L. Gilmore, Louis Simpson, Robert H. Dickson, George J. Stein, C. E. Swann.

# KNOX

Valves-Couplings-Nipples-Clamps-Menders

## MINING SPECIALTIES

### The World's Standard



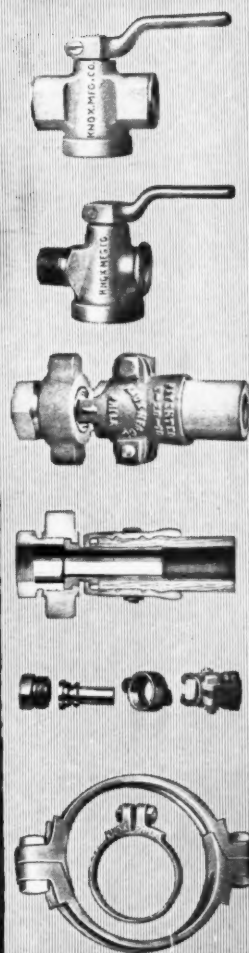
### YOU NEED NOT ORDER---

rather you should requisition your Throttle Valves, Couplings, or Special Hose Connections from your consolidated stock room—KNOX.

We shall give these requisitions the same attention your own storekeeper would accord them.

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We want to cooperate, we want to serve, we *must* serve, as if we were actually on your payroll.



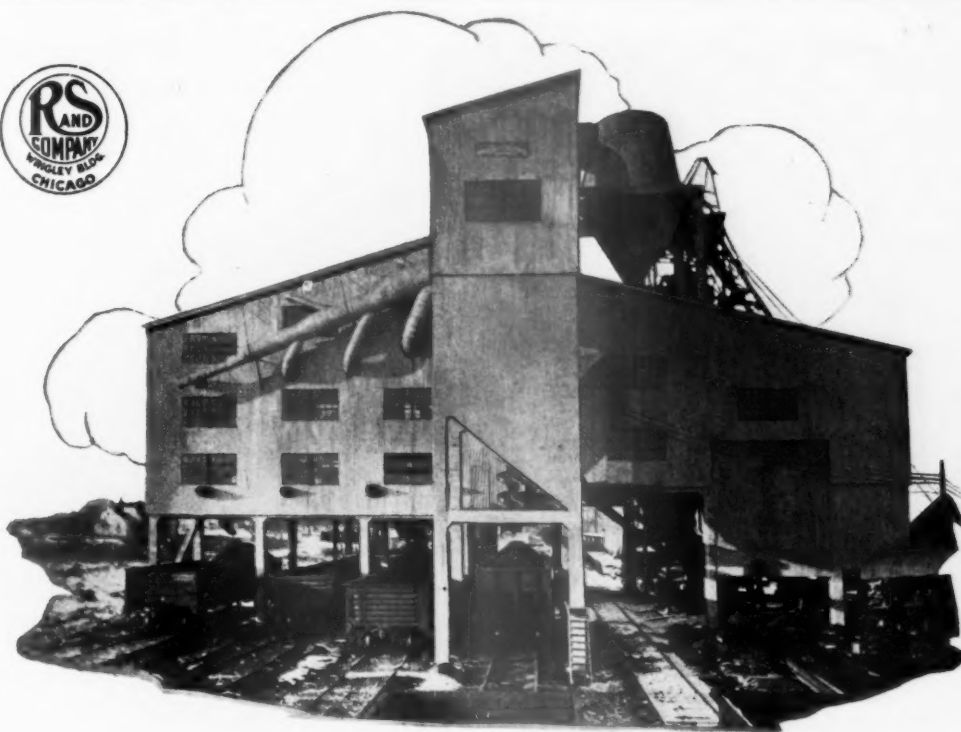
## KNOX MANUFACTURING CO.

INCORPORATED 1911

817 Cherry St.

Philadelphia, Pa.





Arms Dry Cleaning Plant  
Capacity 125 Tons per Hour  
Ayrshire Coal Company, Oakland City, Ind.

## A Development in Preparation that has a Direct Bearing on Mechanical Loading---

By using the Arms Equipment (Screens and Concentrators) in the preparation of coal sizes under  $3\frac{1}{2}$ " an almost 100% cleaning and sizing is obtained.

The Arms Screen operates on a flat slope; it can be operated absolutely level. This means more efficient and more exact sizing, less breakage, greater capacity and less space required—vertically and horizontally.

Arms Air Concentrators eliminate all free foreign matter from the small sizes—and leave the coal dry. They too operate with a minimum breakage and require comparatively little floor space and head room.

We operate a Testing Plant at Harvey, Illinois, equipped with full size Arms Equipment where coals are tested before designing plants for their preparation.

A request will bring full information on the sizing and cleaning of Small Sizes. A visit to the Testing Plant will give positive evidence of the importance and effectiveness of the Arms Method.

*Five new Arms Dry Cleaning  
Plants have just been com-  
pleted at the following mines*

Berwind-White Coal Mining Co.  
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Algoma Coal and Coke Co.  
Algoma, W. Va.  
Elk River Coal and Lumber Co.  
Widen, W. Va.  
Brazeau Collieries, Ltd.  
Nordegg, Alta., Canada  
Ayrshire Coal Co.  
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Others under construction

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COMPLETE MINING PLANTS, DRY CLEANING PLANTS, MARCUS PICKING TABLE SCREENS,  
ROTARY CAR DUMPERS AND LOADING BOOMS

# THE MINING CONGRESS JOURNAL

JANUARY, 1927

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### PRACTICAL OPERATING MEN'S DEPARTMENT

#### METALS

##### Exploration of Prospects

##### Operating a Drill Steel Shop on a Factory Basis

#### COAL

##### Concrete Shaft Linings at Pennsylvania Bituminous Coal Mines

##### Use of Concrete in Mine Timbering

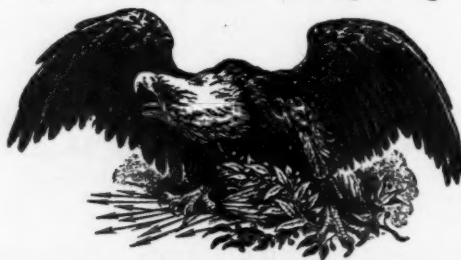
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*Field Representative*

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# **A Conveyor that Moves the Coal with an Even Pull**

- from face to mine cars on entry**
- up grade or on the level**
- with light or full load**



**Easily and Quickly  
Moved, Lengthened  
or Shortened.**

**Stays in Place  
and Operates with-  
out Special Timber-  
ing or Anchoring.**

How it increases production  
with fewer working places,  
saves mine equipment and  
labor, and eliminates trans-  
portation delays is told on the  
following pages.

**The Jeffrey  
Sectional Conveyor**

**The Jeffrey Manufacturing Company**  
958-99 North Fourth St., Columbus, Ohio

# **JEFFREY**

**COAL MINE EQUIPMENT**

**Jeffrey-Standard  
Coal Mine  
Equipment**

Coal Cutters  
Combination Cutter  
and Loader  
Drills  
Conveyor-Loader  
Sectional Conveyor  
Pit Car Loaders  
Locomotives  
Mine Fans  
Tippie Equipment  
Crushers



# Makes Concentrated Mining Practically Any System



Illustration No. 1

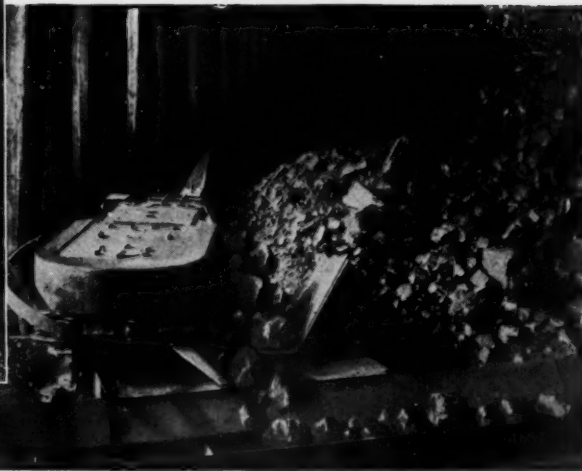


Illustration No. 2

**C**ONCENTRATED mining does not necessarily mean a change in your system of mining. However, to obtain a large production from a comparatively small working territory, the work must be driven rapidly. For example, in room and pillar work, machines must be kept working shift after shift in the same working place.

Slow transportation must be eliminated. Men cannot be kept waiting half the time or more for cars.

Only continuous, adequate, and uninterrupted transportation between face and tippie will make concentrated mining possible.

The Jeffrey Sectional Conveyor is designed to help meet the demand for fewer working places with the correspondingly smaller investment in trackage, wiring, ventilation equipment, etc.

### In Room and Pillar Work

The Sectional Conveyor takes coal away from the Shortwloader (Illustration No. 1), or other loading machines or face conveyors and carries it to a fixed loading point on the entry where a train of empty mine cars is waiting to receive the coal.

The Conveyor is quickly extended to follow

---

# JEFFREY

# Mining Possible In System of Mining

Illustration No. 3



Illustration No. 4

the advance of the Shortwaloader which operates continuously except when shooting the coal. The room is loaded out 4 to 6 times per shift instead of once a shift or once every other shift as is often the case when the men must wait for cars to be brought into the room.

## In Wide Rooms

Where it is necessary to clean the coal at the face a portable conveyor is laid at a right angle to the Sectional Conveyor and the coal loaded onto it by hand (Illustration No. 4).

## For Long Face Mining

The Sectional Conveyor is used as an inter-

mediate conveyor between a Conveyor-Loader and the mine cars on the entry (Illustration No. 2).

In dirty coal the Sectional Conveyor can be laid parallel with the face and the coal shoveled onto it. This permits the men to clean the coal before it is delivered to the mine cars. The tipple receives only clean coal. (Illustration No. 3.)

The Jeffrey Sectional Conveyor was designed by engineers who have had lifelong experience in underground work. Its special features are described on the next page.

---

# Coal Mine EQUIPMENT

# Designed to Meet Underground Conditions

Underground transportation demands a conveyor with many features not found in ordinary conveyors. The following features combine to make the Jeffrey Sectional Conveyor a transportation unit that meets every mine condition.

## Flexible to Follow Rolling Bottom

The conveyor operates over rolls in the bottom without special blocking.

## Single Strand Chain

The single strand chain is of the same type used on cutting machines and the strongest chain for its weight that has been made. It is easily connected or disconnected.

This chain with its scraper flights moves the coal with an EVEN PULL upgrade or on the level. Light or heavy load makes no difference. There is no piling or spilling of coal where the conveyor starts up grade to the loading point, and the coal is positively carried over the discharge end.

The carrying trough is designed to hold the chain on the bottom. It cannot climb the coal under any condition.



Disconnecting a Section

## Easily and Quickly Moved, Lengthened or Shortened

The conveyor can be moved and put in place ready for operation quickly as no extensive cross timbering is required to support the conveyor at the discharge end and no anchoring to floor or roof is needed to hold the conveyor or driving mechanism in place.

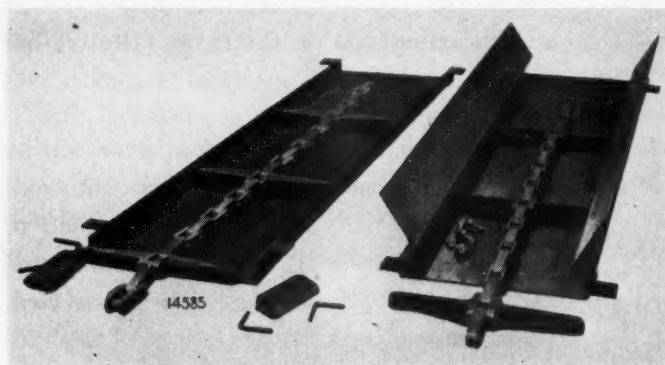
The standard sections are light in weight and easily assembled. Made in 6 ft. sections the average advance of the cutting machines.

The illustration at the left shows a standard section—bottom pan with return strand of chain and conveyor trough with carrying strand of chain.

## Reversible

No track is necessary in rooms or entries where the Sectional Conveyor is used. Timber, additional conveyor sections, and other materials can be carried to the face by reversing the conveyor.

Write for bulletins describing the Sectional Conveyor and other Jeffrey Equipment for Concentrated Mining.



## The Jeffrey Manufacturing Company 958-99 North Fourth St., Columbus, Ohio

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# JEFFREY

## COAL MINE EQUIPMENT

### Jeffrey-Standard Coal Mine Equipment

Coal Cutters  
Combination Cutter  
and Loader  
Drills  
Conveyor-Loader  
Sectional Conveyor  
Pit Car Loaders  
Locomotives  
Mine Fans  
Tippie Equipment  
Crushers



# World's Record Crushers

60-Inch Superior McCully All-Steel Gyratory Crushers Built For Chile Exploration Company, Chuquicamata, Chile

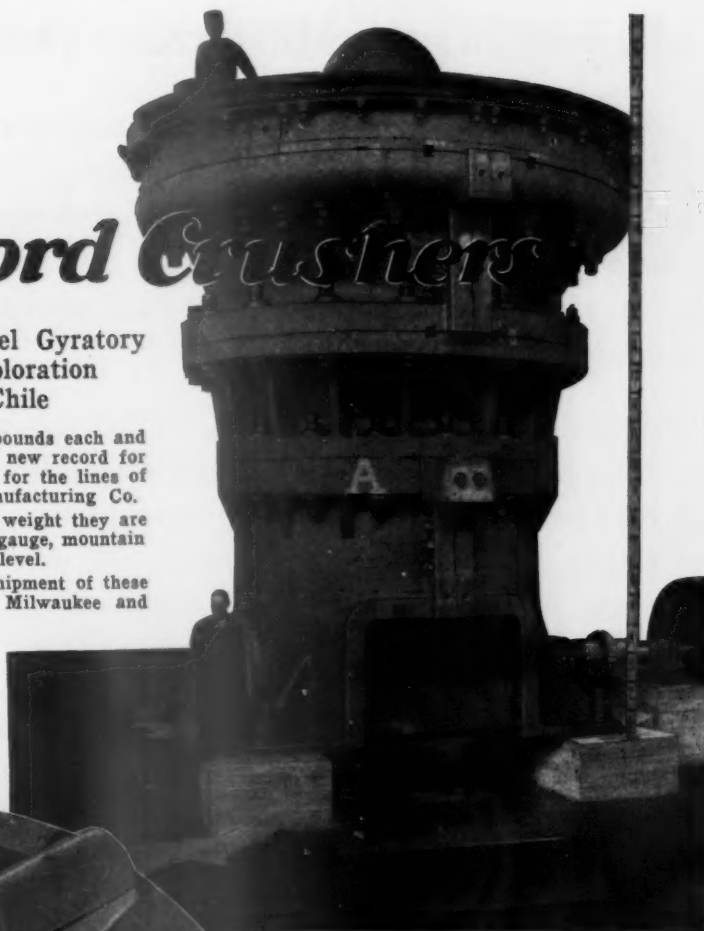
These two crushers, which weigh a million pounds each and which are of all steel construction, establish a new record for Gyratory Crushers and another world's record for the lines of heavy machinery built by Allis-Chalmers Manufacturing Co.

In spite of their extreme size and enormous weight they are sectionalized for transportation over a narrow gauge, mountain railroad to an altitude of  $13\frac{1}{4}$  miles above sea level.

25 freight cars are required to handle the shipment of these two crushers and their spare parts between Milwaukee and New York.

"The Story of the World's Record Crushers," a pamphlet telling of the problems of building and transporting these huge machines will be furnished on application to those interested.

Address ALLIS-CHALMERS MFG. CO.  
Dept. C-13. Milwaukee, Wis., U. S. A.



The two hopper openings, each 5 feet across, permit a carload of ore weighing 70 tons to be dumped into the crusher at one time. Some pieces of the ore will weigh as much as 7 tons. This will be reduced to a 12-inch product. Each crusher handles from 2,000 to 2,500 tons of ore per hour.

# ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

## BETTER MAKE MISTAKES THAN KILL INITIATIVE



No man, nor any organization of men, is right all the time. The only way to avoid all mistakes is to avoid all initiative. Some manufacturers take the attitude that it is their business only to sell goods, and that it is the customers' business to know how to use them. This is a comfortable attitude, and it undoubtedly reduces the manufacturer's chances to make mistakes.

We would rather take the chance of making a mistake in a sincere effort to save money for a customer by recommending a change in the kind of explosive he is using or in his method of blasting, than to follow the easy course of selling him what he has always used, when, in our judgment, this is not the best explosive for his work.

Our salesmen are drilled in this point of view. Admittedly, they are not right all the time; but remember that they are instructed not merely to get the order, but to get the order for the explosives that will break the most material for you, in the best condition, and at the lowest cost. If they insist upon trying to help you, it will be to your interest to consider their recommendations carefully.

For after all, our men are familiar with many blasting operations. They do not know the details of your own work as you do, but they are often able to save money for the man who will interpret their wide experience in terms of his own intimate knowledge of his job.

To mention only a few of the Hercules contributions to better blasting: Hercules Special No. 3 often reduces costs underground in the same proportion that Hercules Special No. 1 reduces costs in the open; Herco blasting saves from 20% to 40% in well-drill shooting when it is applicable; Hercules Extra Gelatins are effecting marked savings by replacing the regular gelatins on many jobs. If not one of these, then perhaps some other suggestion by a Hercules salesman may be valuable to you.

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DENVER  
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SALT LAKE CITY



SAN FRANCISCO  
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Wilmington, Delaware

*Please send me prices on Hercules Flotation Oils.*

Name .....

Company .....

Street .....

City..... State.....



## It always comes back to track

**W**HAT is the most important single essential in successful mine operation? An official of one of the larger coal mining organizations of the country answered with the two words "good track," a sentiment shared by the mining department of the organization.

Underground transportation is the principal factor to be watched when installing mechanical loading. In the work period of several years, manufacturers have encountered more failures through lack of proper car supply on the part of the coal operators, than from any other cause and oftentimes they refuse to consider installing equipment until the mine has been properly arranged for such equipment.

The most successful loading installations under my observation, where shovels are used, do not utilize any such devices but on the other hand, rely on the use of large capacity mine cars, gathering locomotives and switches or sidings placed at proper points to enable quick change of the cars to and from the shovel.

Article also mentioned where  
Section 5100310

These clippings show how in three out of five articles on general operating problems in the December issue of the Mining Congress Journal the importance of track equipment was stressed

Fig. 15—Track Material

### Trackage

All mine tracks are of standard gauge. A switch-back system has been constructed on the north side of the mine.

waste haul is one

**M**OST authorities on the many mining questions agree on the great importance of good track properly fitted to a mine's needs. No other item of mining equipment can outweigh it in significance. Central engineers have made it their business to keep abreast of the new demands. They are glad to offer their cooperation in planning track to meet your needs. For increased safety with economy and speed of haulage let them help on your track layout. Catalog No. 3 free on request.



**THE CENTRAL FROG & SWITCH CO.**

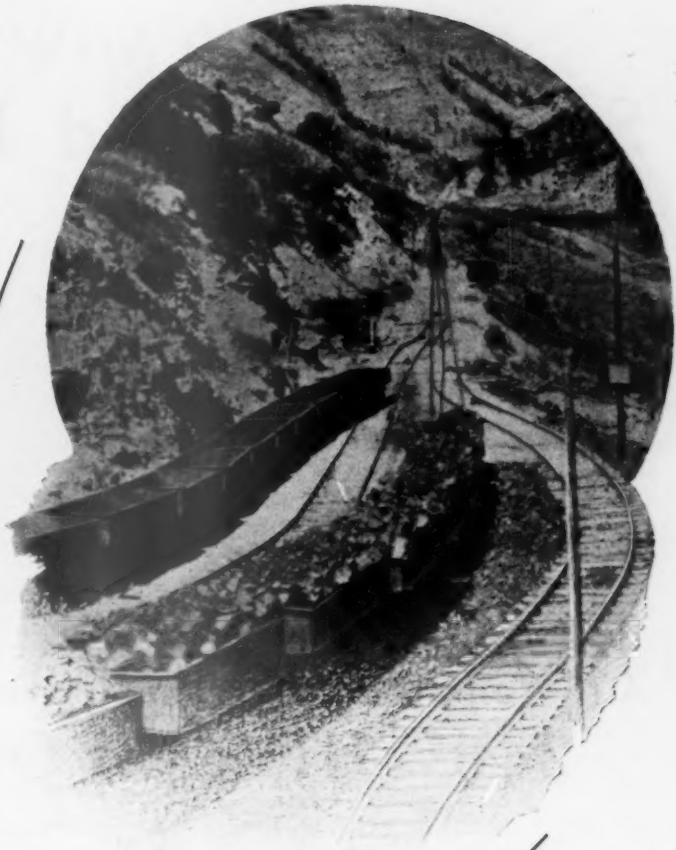
CINCINNATI, OHIO

# CENTRAL

## MINE TRACK EQUIPMENT

# Roebling

## Blue Center Steel Wire Rope



is the ultimate choice of discriminating buyers for every purpose for which wire rope is used.

In mining, exceptional conditions exist which must be met by the use of wire rope possessing exceptional qualities. Roebling Blue Center Steel Wire Rope, by its long, efficient service, has proven that it possesses these qualities.



**John A. Roebling's Sons Company**

Trenton, N. J.



## AND NOW THE Super-Motored Locomotive



### *A 15-Ton Goodman Locomotive with Two 120-Hp. Motors* **240 -- HORSEPOWER -- 240**

Super-motoring extends the well-known advantages of Over-motoring, enabling the locomotive to render with still greater ease the hardest of heavy-duty service.

Standard Motoring.....	180 Horsepower
Over-Motoring .....	210 Horsepower
Super-Motoring .....	240 Horsepower

### ***Super-Motored Locomotives---***

Will operate continuously, over long hauls, at high speeds, on hilly roadways, with maximum loads—

Without overheating, without signs of overload distress, without increase of upkeep expense, and without the greater liability of breakdown delays which such strenuous duty might cause with standard motoring.

Super-motoring increases the net electrical efficiency and introduces a larger factor of safety for the whole electrical equipment. It is well worth while.

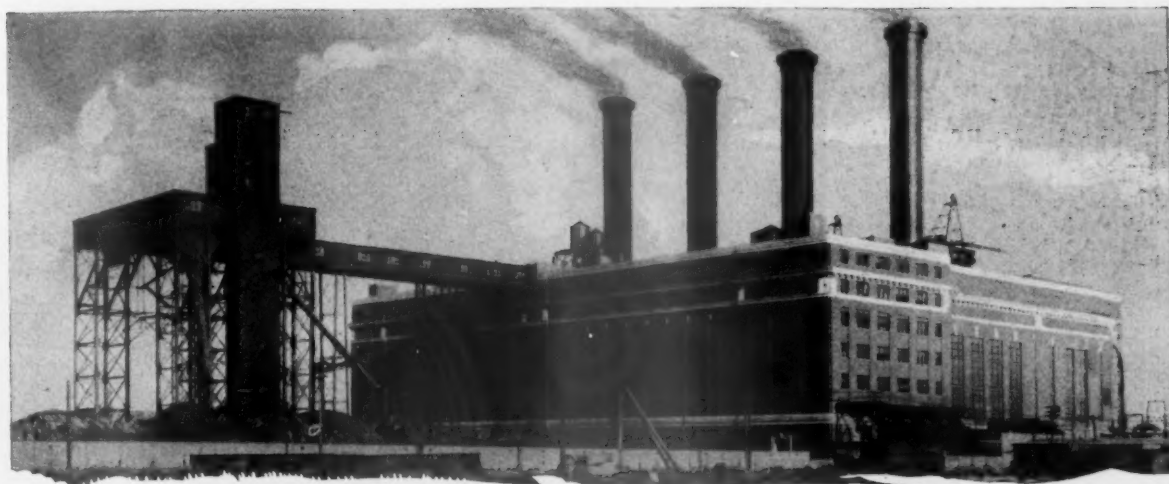
The Nelson locomotive pictured here has also the standard Goodman features of

- Cut-away Frame Plates for Accessibility to Brake Adjustment
- Axle-end Side Thrust Bearings—Ample Road Clearance
- Spring-mounted Bumpers—Large Sand Boxes
- Transverse Equalizers—Long Wheelbase

(38)

**GOODMAN** MANUFACTURING  
COMPANY  
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*The Hell Gate Station of the United Electric Light & Power Co., New York. Genuine Wrought Iron Pipe up to 6" size used for high pressure steam and drip lines, boiler feed and blow-off lines, saturated steam lines, safety valve piping and all steam heating lines. Designing and consulting engineers and architects, Thomas E. Murray, Inc., New York City.*

## *Rust Resistance that is Inherent*

**N**O metal that can be had at so low a cost affords anything like the protection of wrought iron against rust in power and industrial pipe systems.

Experienced engineers know this. The use of Byers Pipe for power installations grows steadily.

At the Hell Gate Station of the United Electric Light & Power Company, New York City, wrought iron pipe safeguards all steam and boiler feed lines five inches and under.

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### *the Spiral Stripe*

protects you against mistakes and substitution

Also look for the name and year rolled in metal.

given double and triple life with Byers Pipe.

The rust resistance of wrought iron is inherent. It permeates the metal evenly and entirely. It is not a coating. It cannot be removed in threading or bending.

In every section of Byers Pipe are thousands of thread-like fibres. Each is sheathed in silicate slag. It is this siliceous structure that affords effective protection against corrosion.

No other metal has this structure. No other welded pipe so resists rust as does genuine wrought iron.

**A.M. Byers Company**

*Established 1864*

**PITTSBURGH, PA.**

# **BYERS PIPE**

**GENUINE WROUGHT IRON**

## How and why it's built like the Vulcan Steam Locomotive

Here is the answer to the demand of the industry for a Trolley Locomotive with the same shock-resistant, long-service features as the Vulcan Steam Locomotive.

### 3-Point Suspension

This 3-Point Suspension of the entire chassis is an exclusive feature of the Vulcan Trolley Locomotive. One pair of springs supports the frame through one set of hangers. One end of another pair of springs is held by other hangers. The opposite ends of the springs engage an equalizing bar extending across the machine and supported in the center. By means of this arrangement shocks are absorbed, the weight is evenly distributed and the locomotive runs smoothly over any ordinary inequalities of track.

### Other Features

#### Cast Steel Bar Frame

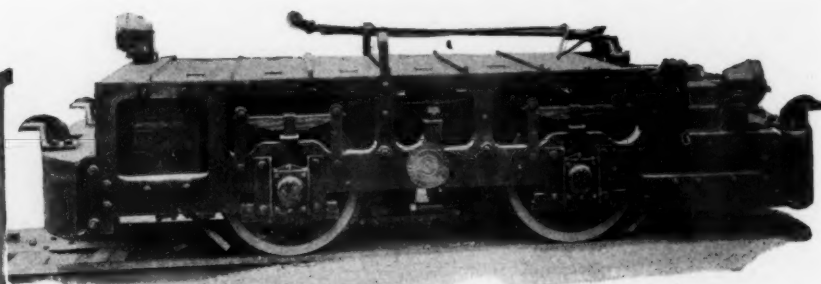
Each side frame is cast in one piece and of steel bar design, thus combining maximum rigidity as well as accessibility. The open spaces permit ample ventilation and simplify inspection.

#### Brake Rigging

The powerful, easily operated brakes, like the other two features, have been adopted in a large degree from Vulcan Steam Locomotive practice.

### Vulcan Products

Hoists,  
Electric and Steam  
Locomotives,  
Steam, Gasoline, Electric  
Rotary Kilns, Dryers, Coolers and  
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## Trolley and Storage Battery Locomotives

For more than 50 years mine operators the world over have been buying Vulcan locomotives.

First the steam locomotive—next the gasoline locomotive, and now, trolley and storage battery locomotives.

Our engineers have put into Vulcan trolley and storage battery locomotives all the cumulative experience of fifty years combined with the most modern engineering practices. They have developed the cast steel bar frame and the 3-point spring suspension among other superior improvements.

This explains why Vulcan locomotives of all types enjoy a world-wide reputation for low operating cost and low power cost. Vulcan Trolley and Storage Battery Locomotives are built to add to this reputation and the general consensus of users is that they do.

Write for the latest Electric Locomotive Bulletin.

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*Don't buy Loading Machines*  
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Mine the entire tonnage with COLODERS.

COLODERS load easily in the most difficult, as well as the more favorable places.

COLODERS are the lowest in price per annual ton. Reliable—they deliver the tonnage steadily. The low maintenance cost will surprise you.

Twenty-five years of experience is built into every COLODER.

Our Mining Engineering Department is at your disposal.

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COLUMBUS, OHIO





## YOU and the Atlas Service Man

**G**ETTING the right explosive to the right job is the great big reason for the Atlas Service Man. He knows which grade of Coalite will give you the highest percentage of marketable sizes of coal under any blasting conditions.

You know a great deal about the conditions encountered in your own mine.

Combine your knowledge with that of the Atlas Service Man and valuable economies must naturally result. Send for him! Write nearest branch.

## COALITE



The permissible explosive  
packed in white paper cartridges

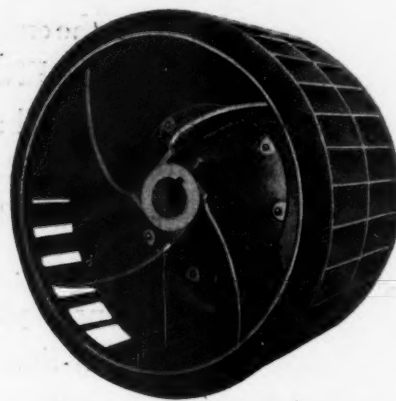
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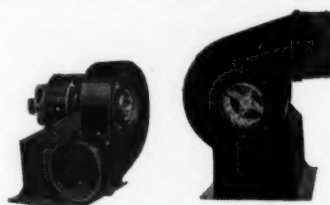
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The air, as it enters the fan inlet, is given a spiral motion by large cones on each side of a central web plate. The four large blades then take it up, accelerate it and pass it on to the small blades at the periphery, where it is discharged at the proper velocity.

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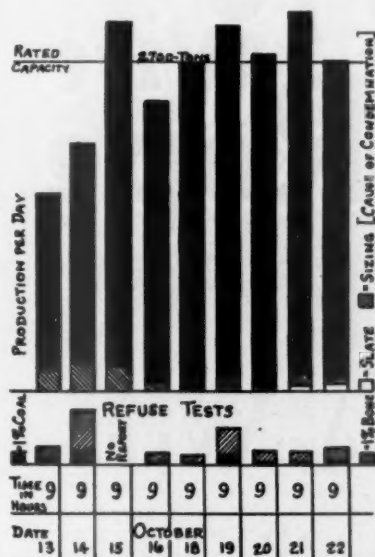
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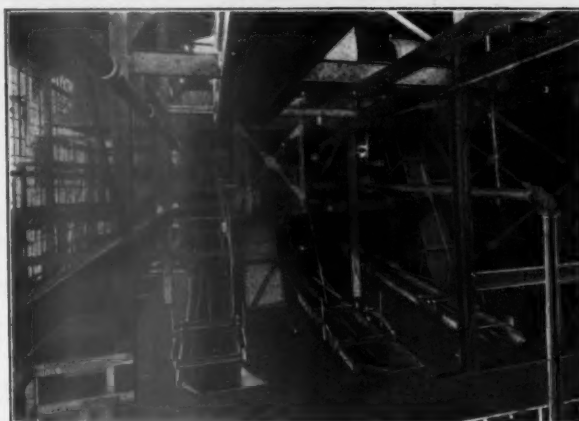


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Interior of Rheolaveur Plant, Loomis Breaker of Glen Alden Coal Company

The Rheolaveur Plant installed in Loomis Breaker of the Glen Alden Coal Co., went into operation on October 13, 1926, and is washing all sizes of anthracite coal from Egg to No. 2 Barley, inclusive, i. e., from 3/16" to 3/64" round hole screen.

The rated output of this plant is 2,700 tons of coal per 9-hour day. Production for the 15 operating days in October was in excess of this rated capacity.

Since October 18, this plant has been operated by the regular Breaker force without any help from Rheolaveur engineers. Note the consistently increasing output shown by the chart with average output from October 18 to 22 at 2,864 tons or 106% of rated capacity.

For three consecutive hours this plant has washed in excess of 400 tons per hour.

The refuse from the Rheolaveur plant contains less than 1/3 as much coal and 1/2 as much bone as the refuse from the jigs which formerly cleaned this coal.

The Rheolaveur washing plant with the accompanying sizing screens is operated by 6 men, whereas 15 men and boys were required to operate the jigs formerly used in washing the same tonnage.

The above conclusively shows that the Rheolaveur delivers results. Let us show you how we can improve your cleaning operation and reduce costs.

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# INSURANCE!!!

General Bulletin No. 43 of The American Mining Congress, Dated Oct. 16, 1926, states:—

*"Insurance companies will refuse insurance on mining companies that do not use rock dust in their mines to prevent dust explosions."*

Do you know that the **CEMENT-GUN** TRADE MARK can be used for "rock dusting" in addition to "GUNITING" your entries, building brattices, overcasts, etc., fireproofing, waterproofing, and numerous other uses around your mines?

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## The Greater Handbook

# SAFETY

THE most recent addition to The Handbook of Standard and Approved American Coal Mining Practice—is Safety Rules for Installing and Using Electrical Equipment in Coal Mines.

These new standards are divided into four general divisions: (1) General Rules, (2) Stationary Electrical Equipment, (3) Portable Electrical Equipment, and (4) Circuits and Conductors.

Under these general classifications are: Voltage capacity; prevention of accidents and fires; gas and dust hazards; electrical equipment on tipples and surface structures; electrically driven mine ventilating fans; electrically operated hoists;

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These standards have just received the official approval of the American Engineering Standards Committee.

## The American Mining Congress

841 Munsey Building, Washington, D. C.

These rules will be released immediately and will make a valuable addition to this practical handbook.

Another recent and valuable supplement has been added to the original handbook in the form of thirty-three detailed drawings of frogs and switches.

*This Handbook is pocket size, loose-leaf and will be kept up-to-date as recommendations are approved. Its price is \$5. This includes a subscription to The Mining Congress Journal. For further information, address The American Mining Congress.*

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THE AMERICAN MINING CONGRESS

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JANUARY, 1927

NUMBER 1

For twenty-nine years the American Mining Congress has watched and participated in the progress of mining.

## TWENTY-NINE YEARS OF SERVICE

Through its periods of depression, through its periods of prosperity and when it was neither booming nor depressed, that organization has kept its finger on the pulse of the industry. In that twenty-nine years the growth of the

mining industry as a whole has been phenomenal. Particularly in the metal industries has the development been startling. Twenty-nine years ago such an achievement as the development of the great porphyry coppers was not contemplated. But today they stand, bulwarks in our industrial life, a tribute to the ingenuity of the miner, upon whose shoulders rests civilization itself. Twenty-nine years ago anthracite coal little resembled the great American industry it is today; an industry that furnishes the eastern centers of population with an incomparable fuel. Bituminous coal seems to be unlimited in its potentialities. Not only has this industry formed the basis upon which rests our national industrial prosperity, but its contribution to the sciences is phenomenal. Bituminous coal is the nucleus of 1,500 industries, many of them developed within the past twenty years, all furnishing employment to thousands of wage earners. It has only

been in the comparatively recent past that copper has realized its possibilities in our commercial life. Mr. Brophy in this issue of the JOURNAL presents some startling facts about copper—most of them not dreamed of twenty-nine years ago. To understand the growth of zinc during this period, one has but to read the illuminat-

ing article which appeared in the September, 1926, issue of this JOURNAL by Stephen Tuthill, to learn what the producers of that metal are contributing to the world. The two metals which have been used as monetary bases, are the only two which have shown no remarkable progress—gold and silver. Just now they are starting investigative work that promises results for this industry.

For twenty-nine years the American Mining Congress has held annual conventions, at which leaders in all branches of the industry have come together for the purpose of formulating a program upon which the industry could pull together. Its twenty-ninth convention, recently held at Washington, D. C., and reviewed elsewhere

in this number of the JOURNAL, developed a program of outstanding importance. Leaders in the industry met with Government officials in discussing mining problems. Cabinet members, leading operators, representatives of national and state associations, representatives of manufacturers of mining equipment, all met and freely discussed how mining might be made more efficient, how it might be of greater assistance to our nation, and how, collectively, it might solve its problems.

Nineteen twenty-seven finds the industry faced with comparatively few major issues. Coal and silver have the weightiest problems. But there is a decidedly greater spirit of cooperation among the various branches, and a better understanding of the needs of the industry as a whole.

## NINETEEN TWENTY-SEVEN

THE American Mining Congress and the Mining Congress Journal wish its members and readers a year of prosperity; a year of unity in solving their problems; a closer spirit of cooperation not only among the various branches of the big mining family, but also with all agencies that go to make us the greatest nation on earth.



As its thirtieth year of service begins, the American Mining Congress, grown in these twenty-nine years, from a handful of earnest men to a great organization comprised of thousands of individuals, and representing eighty percent of mineral production, stands ready to attempt whatever may seem to be for the greatest good of this great industry.

For many years the bituminous coal industry was the only large industry in the United States acutely suffering because of its capacity to produce a much larger amount of coal than could possibly be consumed. Because its needs were misunderstood by the public it became the scapegoat of public criticism and while it was furnishing coal to the public at a very low price, so low that no profit remained to the operators, as a whole it was continuously condemned because the price of coal in the bin of the consumer cost almost as much per ton as it would cost to haul a ton of dirt from the suburbs and put it in the same bin.

**CAN PLENTY  
PRODUCE  
WANT**

Increased efficiency based upon invention, and super-organization with its consequent directing ability have brought about a surplus of production in many other lines. Later that great beneficent optimist, the International Harvester Co., through the manufacture of labor-saving farm devices and furnishing such manufactures on credit to the farmers, has enabled the farmer to till more land with the same energy. Nearly every line of production is now able to supply more of its output than can be conveniently consumed. The world's industries have undergone and are now undergoing a change which in the end means more of comfort, more of luxury, more of all the things which humanity ever have been or are now enjoying.

If all productive agencies could be continually employed in the production of necessities and luxuries and these efforts so divided as to furnish an amount of each proportioned to the public desire and the means developed by which these could be evenly distributed, a worldly Utopia would be established.

In Benjamin Franklin's time waste and want were supposed to travel together and in that day any use beyond actual need or which could reasonably be avoided was considered waste. In the present day of greater efficiency a use which parsimonious economy might consider a waste may be essential to continuous employment. In other words proportionate increase of consumption must follow the increase of production if our production agencies are to be continuously employed.

All the above thoughts are suggested by the present discussion in farm bloc circles of the desirability of governmental restriction and control of the acreage to be planted in cotton and some other crops of which there is a surplus. Restriction of production means that the public will have less. The Malthus theory advanced many years ago and recently urged again by an eminent scientist, pointed out an increasing population would soon find itself without proper food supplies—first, because farm acreage was limited and the soil was being rapidly depleted.

The fact is that through the mining industry soil foods are now available which increase the productivity of the soil far in excess of the ratio of population increase. The world does not need a decrease in production effort. It does need a better division of this effort and better distribution of the product, neither of which can be secured by governmental interference and both of which may be accomplished through a better organization of business for which many outstanding examples of business organization now condemned as trusts but which in fact, because of their higher efficiency are the greatest aids to the advancing civilization of the human race.

Not long ago a mine operator publicly stated that the only reason he ever looked at releases from various government departments was to ascertain if they contained anything that was compulsory.

Does that mean that the government at Washington has so deluged the mine operator with material that he no longer believes that its recommendations are worth reading, except as they must be applied to his operation? It is true that government information is distributed with a prodigal hand. The operator's daily mail from government agencies is considerable. Most of this material is interesting, instructive and valuable to someone. But the process of elimination is tedious.

Many of the recommendations of the Bureau of Mines are exceedingly valuable to the mine operator. For example, their releases on permissible equipment. Their work in this connection is decidedly worth while, and their recommendations valuable but in no sense compulsory. The bureau has unusual facilities for testing various mining equipment in regard to safety. They have a mine at Bruceton, Pa., at which the equipment may be tested. Their recommendations upon this subject, based upon experimentation, should mean something to the mine operator, and to the manufacturer of mining equipment. This service by the bureau is purely in the interest of safety. Manufacturers of mining equipment voluntarily submit their equipment for tests, but should the equipment fail to meet the requirements there is no regulation which prohibits its manufacture or use.

The bureau, of course, is using every legitimate means to prevent the use of equipment its tests show "unsafe." The state mine inspector is advised of the result of the tests, but is in no sense bound to accept the bureau's decision. The ultimate aim, naturally, is that state mine regulations shall incorporate eventually, in their rules, regulations regarding equipment, based upon the safety work of the bureau.

The American Mining Congress has for years been studying the most efficient types of mining equipment. Their Standardization Division has issued as recommended standards, specifications for mine equipment. These recommendations are in no sense mandatory. They are issued in the interest of efficiency and safety. In their promulgation they have had the cooperation of the mine operator, the manufacturer of mine equipment, and the Bureau of Mines. They, like the bureau's "permissible" equipment, hope for wholesale adoption by the mining industry.

The efforts of the bureau to further safety in mining operation through the use of permissible equipment deserves the wholehearted commendation of the industry. Every operator should read the recommendations upon this subject, and insist that their equipment shall conform to safety rules, as well as to the standardized equipment recommended by the American Mining Congress. Permissible equipment does not necessarily mean standardized equipment, but all standards recommended by the American Mining Congress include recommendations for safety.

The mining industry wants safety, plus efficiency. Standardized-permissible equipment will give it to them.

**RECOMMENDA-  
TIONS**

A leading editorial in the New York Times under the heading "The Disappointment" begins as follows:

**THE  
FALL-DOHENY  
CASE**

"One has but to read the newspapers' comment all over the country on the outcome of the Fall-Doheny trial to see that the verdict of the jury carried with it almost everywhere a sense of chagrin

and something like resentment."

This statement might well be made by a mob on the jail steps seeking to find an excuse for the lawless act which it is about to perpetrate; the law has failed, or will fail, to properly punish the jailed culprit and their sense of "chagrin or resentment" backed by a popular feeling that in some way an accusation is equivalent to guilt justifies the proposed outrage. This seems particularly true when the accusation is made by the Government of the United States, when the case is taken away from the regular prosecution agencies of government charged with the responsibility of seeing that justice is done and special counsel is employed charged with the duty of conviction.

The public, which can not know the facts except through the public press, which facts the public press has failed to print, can scarcely be blamed for holding a biased opinion. But the major part of that public would accept the verdict of the jury except for the criticisms of the *New York Times* and the many papers which it quotes. Thanks to the integrity of our courts, the jury, unswayed by popular clamor, found no fault in the defendants but yet the mob, according to the *New York Times*, is still unsatisfied and feels "a sense of chagrin and something like resentment." What, then, is the cause of this attitude on the part of the public?

May we not find its root in that soil which breeds socialism; among those who believing that all men were born equal believe that all men should remain equal; that personal initiative, thrift and industry should not earn special reward, to prevent which the Government should become the great leveller; among those who, perhaps unconscious of the extent to which the virus of socialism had grown into their consciousness, were responsible for the leasing system as applied to the public lands; among those who believe that the Government should own and operate the coal mines and the oil wells—or who at least insist that production in these lines are public uses and should be controlled and directed by the Government; among those who believe that the right of the several states to govern themselves as provided by the Constitution shall be usurped by the Federal Government whenever a state shall fail temporarily to meet its responsibility; among those who believe that success is a crime, that the successful are necessarily dishonest and always under suspicion.

From the viewpoint of the agitators no man in position to fix the terms of a contract involving millions of dollars would be so honorable as not to take advantage of his position. Fortunate indeed is the nation that a great majority of its citizens are honest, although the suspicious few can not believe it. Fortunate indeed are we that most men in public life are fairly representative of the integrity of the masses.

When so great a body as the Senate of the United States allows a minority thereof to force it to become a grand jury and spy and sleuth about the country in the hope that they may make some disclosure upon which to hang a sensation, we can only expect that the great majority of the American people will be misled by those misstatements of fact which are essential to justify the

agitation, developed by the scandalmongers who hope thereby to obtain political preferment.

What are the facts? First, many years ago the Government of the United States at an average price of 4½ cents per acre purchased from Mexico a large territory much of which was considered to be and was valuable at the time, but a considerable part of which was then considered worthless. In the worthless area of that territory were 10,000 acres of land later known as the Elk Hills Naval Oil Reserve. This and many hundreds of thousands of similar acres, worthless at the time of its purchase, were made valuable by the Dohenys and others of similar character who took enormous chances in developing the mineral lands of the West. These prospectors, by the hundreds, spent all they had, all they could borrow and endured hardships beyond description in digging holes which in many cases proved to be worthless but occasionally developed a valuable mineral body.

By virtue of the activities of these brave western pioneers it was developed that the territory embraced within the Elk Hills Naval Reserve probably was underlaid with petroleum. The Government of the United States in order to provide fuel oil in case of war emergency reserved this section for the use of the Navy. Shortly thereafter the World War came upon us with its need for enormous quantities of fuel oil by the Navy. The Doheny type of prospector made available at all times sufficient oil to meet the Government requirements at a price fixed by the Government. The Government reserves did not and could not meet these emergencies.

At the conclusion of that war Army and Navy experts concluded that the oil contained in this Naval Reserve should be made available for future defense and cast about for someone patriotic enough and financially strong enough to carry out an enterprise requiring an enormous investment.

Mr. Doheny was asked to become a bidder. He refused on the advice of his business associates who did not believe that the enterprise was justified on a business basis. Mr. Doheny's patriotism was appealed to. This appeal reached that tender spot which is the basis of all real patriotism. He made an offer to the Government which was accepted by the lawfully authorized Government agents, and then proceeded to spend millions of dollars in the performance of his contract.

There was anticipated the possible expenditure of \$150,000,000 with the agreement that in case of success better than one-half of the net proceeds should go to the Government, and in case of failure that he himself, should stand the total loss. We believe this contract was the best contract for the Government ever made by it in its history. By it, the Government for property which cost \$4,500, immediately became better than half owner in a probable investment of \$150,000,000. No private owner of mineral lands was ever able to make so favorable a contract for the development of undetermined mineral reserves. Can it be said that a trade of \$4,500 worth of property for a consideration of \$75,000,000 is a bad exchange for the Government?

The very magnitude of the operation and the patriotic impulse which incited it set in operation the flames of suspicion. From the standpoint of the investigators—the man who occupied a commanding position was sure to take advantage of that position.

It is extremely unfortunate that all men in public life are not possessed with the patriotism, the integrity and the public spirit of Edward L. Doheny. Fortunate, indeed, are we that the integrity of our courts and our jury system stands against the mob which reiterates its ancient cry, "Crucify him, crucify him."



The tremendous increase in state and local taxes during recent years should cause every citizen to pause and study his local situation before lending his support to any public project which may unnecessarily further increase the present tax burden. The fact that less than one-half of the population of lawful age exercises the right of franchise

**ALARMING TREND  
OF  
STATE TAXATION**

proves that every increase in public indebtedness, in public expenditures, and in state and local taxes is brought about by the will of a minority of the country's citizenship. In many instances it will be found that bond issues proposed and authorized by this minority are not excessive, but are necessary to the development and growth of the community; that increased expenditures authorized by state legislatures and municipal governments elected by minorities are no greater than growing communities require; that increases in state and local taxes are justified in providing for adequate school facilities, highway improvements, health and sanitation, and other public improvements needed to meet the modern necessities of a constantly growing population. Nevertheless, the present trend in general is alarming.

The problem confronting the average citizen is how best to make his influence felt in the determination by his local and state governments of what improvements are essential and what are not. At the present time the average citizen neglects his duty in this regard. He has become used to having these matters largely determined for him. Then he is influenced, no doubt, by what other states and communities are doing and without carefully comparing the differences in conditions that may prevail, he is inclined to favor every measure that will bring his state and community up to what he believes are the standards of other states and communities where public improvements are, in his opinion, far ahead of his own. Instead of relying upon his own impressions or upon the opinions of those advocating this or that proposition involving increased public indebtedness, expenditures, and taxation, he should acquaint himself with all the facts, exercise his right of franchise in all elections, and should vote according to the dictates of his own conservative judgment. This unquestionably would produce greater efficiency in government and would tend to discourage wastefulness of public funds and maldistribution of the tax burden.

The growth of state and local taxes was discussed by L. R. Gottlieb, of New York, at the recent tax conference held in conjunction with the Twenty-ninth Annual Convention of the American Mining Congress. The statistics presented by him are as follows: In 1890 the total amount of taxes levied in this country for all governmental purposes was only \$875,000,000. Of this amount local governments raised \$405,000,000, state governments only \$96,000,000, and the Federal Government \$374,000,000. In 1903 the total levied was \$1,382,000,000, of which \$706,000,000 was raised by local governments, \$155,000,000 by the states, and \$521,000,000 by the Federal Government. In 1913 the total for the country was \$2,194,000,000, of which local governments raised \$1,219,000,000, the states \$307,000,000, and the Federal Government \$668,000,000. In 1923 the total was \$7,766,000,000, of which \$3,601,000,000 was raised by local governments, \$945,000,000 by the states, and \$3,220,000,000 by the Federal Government.

Beginning with the year 1919 local taxes increased as follows: In 1919 they were \$2,395,000,000; 1921, \$3,150,000,000; 1922, \$3,301,000,000; 1923, \$3,601,000,000; 1924, \$3,748,000,000; 1925, \$3,956,000,000. State taxes

in 1919 totaled \$570,000,000; 1921, \$783,000,000; 1922, \$858,000,000; 1923, \$945,000,000; 1924, \$1,064,000,000; 1925, \$1,107,000,000. Federal taxes have declined as follows: 1919, \$5,069,000,000; 1921, \$4,430,000,000; 1922, \$2,802,000,000; 1923, \$3,220,000,000; 1924, \$3,095,000,000; 1925, \$3,069,000,000.

These figures are exceedingly interesting, especially in view of the fact that state and local bonded indebtedness has increased from approximately \$4,000,000,000 in 1913, to more than \$11,500,000,000 in 1926. It is estimated that the increase in state and local bonded indebtedness since 1919 has been at a rate of more than \$1,000,000,000 each year. Thus it will be seen that state and local governments have been mortgaging the future very rapidly at comparatively high rates of interest. This means that there is little hope for any relief from state and local tax burdens during the next generation except through the will of the taxpayers themselves to prevent unnecessary increases in public indebtedness, expenditures and taxation in the future. Taxpayers must protect their own interests and demand the highest efficiency from their governments.

Taxpayers are quite able to handle their own affairs. In many states they have organized, and public officials are responsive to their desires. In the states and communities where taxpayers' associations are articulate and effective they have exerted great influence in tax legislation and in the collection and disposition of public funds. A. G. Mackenzie, of Salt Lake City, a well-known authority on state and local taxation, stated to the conference that "Taxpayers' associations contribute most directly to the solution of their state and local problems through efforts for the utmost economy, consistent with efficiency in the expenditure of public money. This is the controlling program of most of the existent associations, although they render other valuable services."

Taxpayers have two choices in dealing with state and local fiscal problems. First, the establishment of a state agency to control local bond issues and expenditures, and second, the creation of their own organizations for that purpose. The first would place the responsibility for the control of local bond issues and expenditures in a state commission or board. The second would leave this responsibility largely in the hands of the taxpayers themselves, where it now rests but is not generally assumed. It is believed that taxpayers generally will be better satisfied and better served through the second plan. But one method or the other of exercising control over state and local fiscal matters will have to be adopted in all of the states if the present uneconomic trend of fiscal affairs in the states and their political subdivisions is to be abated.

The United States Bureau of Mines was created for the avowed purpose of bringing about safety in the mining industry. Now that bureau finds itself obliged to limit the number of mines and quarries that may enter into the National Mine Safety Competition for 1927. And because it has not sufficient funds with which to employ one or two additional clerks, to look after the necessary detail records! A mere matter, at the most, of \$3,000.

The following resolution was adopted at the recent meeting of the American Mining Congress, sponsored by Howard I. Young, chairman of the Mine Safety Section, National Safety Council:

**"FOR THE  
WANT OF A  
NAIL"**



WHEREAS the statistical information made available through the National Safety Competition conducted by the United States Bureau of Mines is of inestimable value in directing accident prevention efforts throughout the mining industry: Therefore be it

*Resolved*, That the National Safety Competition should for both economic and humanitarian reasons be conducted on a scale adequate to fully meet any call made upon it by the mines and quarries of the United States, and the American Mining Congress reiterates its endorsement of this activity of the Bureau of Mines.

While we agree with the wisdom of this great organization in unanimously passing such a resolution, we can not but wonder what has become of the great purpose back of the creation of the United States Bureau of Mines. Have the activities of the bureau become so diffused, have its interests spread to such an extent that it has lost sight of its original purpose? Should not the appropriations of the Bureau of Mines be spent *first* in doing that thing, or those things for which it was created, rather than in doing many things of more or less importance leaving its greatest work uncompleted because of lack of funds?

The Bureau of Mines has had a tendency to take in more and more territory as the years have gone by, a tendency to do many of the things that should more properly be done by outside agencies. The consequence has been that work for which it was created has been curtailed, in order that the bureau might expand in other directions. There has been bitter rivalry between certain bureaus in the Government as to which activity belonged to which agency. The Bureau of Standards has felt, and properly so, that certain activities should be left solely to it; the Geological Survey, the great statistical agency of the mining industry, has felt that the bureau should keep out of its field. In order that there might be an elimination of this duplication of effort, the Bureau of Mines was torn from the Interior Department and made a part of the Department of Commerce, not because it logically belonged to the Commerce Department, but because a mining man was at the head of that department, and calculated to be equipped to understand the needs of the mining industry.

We have never fully approved of the transfer of the bureau from the Interior to the Commerce Department. We have felt that when any reorganization of Government departments should take place that a Department of Mines and Mining was the right step. If our readers carefully analyzed the article in the December issue of this publication, which dealt with Government departments and the mining industry, they must have been appalled at the number of departments, bureaus, commissions, etc., through which the mining industry must transact its business with government. Certainly that article is argument enough for reorganization of government agencies.

The Bureau of Mines has done wonderful work in regard to mine safety, which is essentially, primarily and eminently their work. Let them lop off some of their activities along other lines, and stress more definitely the safety idea. The mining industry wants above every thing else, safety in operation. Hundreds of mining companies—notably Mr. Young's company, the American Zinc Co.—have done marvelous work along safety lines.

One of the greatest needs of the mining industry is coordinated effort. Too many agencies are attempting the same work. And the Bureau of Mines is no exception. "For the Want of a Nail,"—Surely the mining industry is wiser than to find itself in such a position!

Measures have been proposed in Congress for the regulation of the coal industry. Similar proposals are made every time Congress meets.

The subject of coal regulation is a popular topic with politicians. It can always be made a burning issue when no other topic of general public importance is available.

The attitude of coal labor unions is a more or less constant threat. The attitude of coal operators is that they should be permitted to exercise all the privileges of ownership and management within the bounds of sound business and public policy, and that they, like any other legitimate business or industry, should be protected in the proper exercise of these rights.

When the coal operators refuse to accept the dictation of the labor unions, a great cry goes out against the coal industry, and the agitation for Government regulation and control is intensified. Now why should the public be aroused against the coal operators only? Why should not the attitude of the labor unions be subjected to public censure and the clamor for regulatory legislation? It simmers down simply to this proposition: that the coal industry is subjected to clamorous criticism and vicious abuse merely because its operators refuse to yield all the way to the dictatorial demands of outsiders who have no financial interest in their affairs other than that which they may gain by forcing the operators to pay the wages they prescribe, and collect the union dues they impose which they apparently do not wish to trust to voluntary payment by the union members. So they try to arouse public sentiment against the coal operators and public sympathy for themselves by bringing into their harangues and propaganda every other possible condition affecting labor in the coal mines, except the real issues—union dictation of management and employment and collection of union dues by the coal operators for the union officials.

The coal mining industry, if permitted to deal with its problems without Government interference, and if protected against the influence of socialistic and bolshevistic appeals and tendencies, can meet and adjust any difficulties that confront it, not only in its own interests but in the interests of the public. The continual threat of further Government regulation and control is responsible in a large measure for the inability of the coal industry to meet its problems satisfactorily and expeditiously. The constant agitation of the idea that political influences may gather sufficient strength to put over a program of Government regulation and control keeps this industry in a state of uncertainty and disorganization. The fact that conservative policies seem to prevail at the present time do not alter the situation for the reason that propaganda and political hammering go on unabated with no apparent check upon their momentum such as would be made effective if the people knew all the facts which propagandists and political demagogues purposely fail to disclose and even seek to conceal.

The extension of Government regulation and control over private enterprise is undemocratic and savors of the worst type of political autocracy—Bolshevism. To single out a particular industry for such regulation and control should be unthinkable under a free government where the parties to a controversy have recourse to judicial tribunals when the constitutional rights of either have been denied or usurped. The proponents of such legislation are not contributing anything either to the welfare of the country or to the solution of the so-called coal problem.

#### HINDERING ADJUSTMENT

# AMERICAN MINING CONGRESS HOLDS 29th ANNUAL CONVENTION

*Program For Twenty-Ninth Annual Convention The American Mining Congress One Of Outstanding Importance—Stanly Easton Elected To The Presidency—Resolutions Adopted Outlining The Industry's Position Concerning Its Problems*

A RESUME of conditions affecting the several branches of the mining industry successfully opened the Twenty-ninth Annual Convention of The American Mining Congress, at the Mayflower Hotel in Washington, D. C., Tuesday, December 7, 1926, and provided incentive for increased interest in succeeding sessions, at which the various problems pointed out were discussed.

The convention adjourned at noon Friday, December 10, after four days of constructive and productive deliberation in consideration of topics including: "Politics and Natural Resources"; "A Unified Labor Program"; "The Stabilization of Mineral Production"; "Mine Taxation"; and "The Elimination of Waste Through Standardization."

Officers and directors for the ensuing year were elected as follows:

President, Stanly A. Easton, Bunker Hill and Silver Mining and Concentrating Co., Kellogg, Idaho; first vice president, Wm. H. Lindsey, Napier Iron Works, Nashville; second vice president, Robert E. Tally, United Verde Copper Co., Jerome, Ariz.; third vice president, Geo. B. Harrington, Chicago, Wilmington and Franklin Coal Co., Chicago; secretary, J. F. Callbreath, Washington, D. C.

Executive Committee: Mr. Easton; Archibald Douglas, United Verde Extension Co., New York; Sidney J. Jennings, United States Smelting, Refining and Mining Co., Boston.

Directors: Hugh Shirkie, Shirkie Coal Co., Terre Haute; Mr. Easton; J. G. Bradley, Elk River Coal Co., Dundon, W. Va.; L. S. Cates, Utah Copper Co., Salt Lake; Mr. Douglas; J. T. Skelly, Hercules Powder Co., Wilmington, Del.

These and H. W. Seaman, of Chicago; Bulkeley Wells, of San Francisco; and E. L. Doheny, of Los Angeles, make up the present board of directors.

Because of illness in his family, Hugh Shirkie, retiring president, was not in attendance.

The short addresses at the opening session, which were in effect reviews of conditions in the branches covered, were delivered by the following speakers on the subjects indicated: "Anthracite Coal," E. W. Parker, director, Anthracite Bureau of Information; "Bituminous Coal," Dr. A. A. Willetts, statistician of the National Coal Association, reading a paper by Walter Barnum, president of the National Coal Association; "Gold," J. W. Ady, Jr., mining engineer, Colorado Springs, Colo.; "Iron," R. C. Allen, Lake Superior Iron Ore Association; "Lead," Frank M. Smith, director

of smelter, Bunker Hill & Sullivan Mining and Concentrating Co.; "Zinc," J. D. Conover, secretary Tri-State Zinc and Lead Ore Producers' Association; "Silver," Fred Carroll, former mine commissioner, Colorado; and "Non-Metallics," H. T. Edgar, of Edgar Bros. & Co., Metuchen, N. J. H. W. Seaman, of the Trojan Mining Co., and chairman of the board, Inland Waterways Commission, presided.

Each of these addresses is presented in full elsewhere in this issue of THE MINING CONGRESS JOURNAL.

The growing tendency toward centralization of government in Washington is a matter of fundamental interest to all business, the Hon. Herbert Hoover, Secretary of Commerce, told the convention in its Tuesday afternoon session, although he ascribed much of the present tendency to the shortcomings of business men themselves, and the failure of states to assume their own responsibilities. Secretary Hoover's address is printed in full in this issue.

The Tuesday afternoon session was given over to discussions generally on the relation of politics to natural resources. Speaking on "The Coal Argument Against Governmental Interference," Harry L. Gandy, secretary of the National Coal Association, opposed such interference, referring particularly to bills now pending before Congress, especially the Parker bill in the House and the Copeland bill in the Senate. "It is difficult to understand," he said, "how anyone who is familiar with the complexities of the coal-mining industry and the inefficient character of bureaucratic administration can believe that the effect of such bureaucratic control would be anything less than more expensive and higher prices." Mr. Gandy's address will appear more fully in the February issue of THE MINING CONGRESS JOURNAL.

With regard to the disposition and control of the public lands of the West, F. W. Mondell, former Congressman from Wyoming, declared that the Government had gone far afield in permanently fixing bureaucratic control over large areas in the Western States. There is no good argument for extension of such control over any of these lands, in his opinion. With particular reference to the public lands which contain minerals, W. Halverson Farr, assistant attorney general of Utah, speaking as a representative of Gov. George H. Dern, voiced much the same sentiments, asserting that such lands should be at once ceded by the Government to

the several states. The present situation, Mr. Farr said, prevents the states of the West from enjoying the full measure of sovereignty enjoyed by Eastern States.

The bugaboo of an oil shortage is not founded on facts related to the immense potential production of oil from shales, DeLos D. Potter, of Denver, told the convention, for with the diminishing of the supply from wells the production from oil shales can be made sufficient to supply the country's needs without greatly increased prices for hundreds of years. Mr. Potter's paper, as well as those of Mr. Mondell and Mr. Dern, will be presented more fully in the February issue. The address by Judge Nathan B. Williams, associate counsel of the National Association of Manufacturers, on "A Sensible Application of Our Anti-Trust Laws" also will be printed next month.

"A Unified Labor Program for the Bituminous Industry" was discussed illuminatingly by the Hon. J. J. Davis, Secretary of Labor, and his remarks are presented in their entirety on other pages of this issue. A conference to work out a plan to make coal mining a prosperous industry to meet all demands was suggested by the Secretary of Labor.

A story on the labor relations in metal mining, with particular reference to a plan now working out successfully in his own company, was told by Cleveland Dodge of the Phelps-Dodge Corporation. Mr. Dodge's paper appeared in full in the December MINING CONGRESS JOURNAL. Howard I. Young, of The American Zinc, Lead & Smelting Co., spoke along the same line with respect to his property and policies.

Discussing the conditions with respect to labor in the non-union fields of West Virginia, J. G. Bradley, of the Elk River Coal Co., said the mines there are now exercising their right to manage the properties. A human relationship between employers and employees is maintained, he declared. Mr. Bradley opposed Government control of mines and asked the Government to "keep out of the back yard" of the coal industry.

The South came in for attention in two sessions of the convention, first when Dr. A. F. Greaves-Walker, director, Department of Ceramic Engineering, North Carolina State College, discussed the development of non-metallic industries of the South, and then, when Dr. Henry Mace Payne spoke on the "Mineral Development of the South." Dr. Payne's address was printed in the December issue of this magazine.

Dr. Greaves-Walker's paper will appear in full in the February issue. One of the greatest needs for southern development, Dr. Greaves-Walker said, is capital for the proving out of the resources disclosed by surveys recently made there by the American Mining Congress.

The zinc industry is finding itself, according to Stephen S. Tutthill, secretary of the American Zinc Institute. An amendment to the anti-trust laws to permit organizations of producers of mineral products to curtail ruinous competition and to stabilize markets, much as foreign countries permit, was strongly advocated by Mr. Tutthill.

How marketing may revolutionize coal production was explained in a straightforward way by Harry N. Taylor, of the United States Distributing Corporation, in an address, which appears in full elsewhere in this number of THE MINING CONGRESS JOURNAL. Other discussions relating to the stabilization of mineral production, including that by Robert E. Tally, of the United Verde Copper Co., Jerome, Ariz., and that by Thomas D'Arcy Brophy, of the Anaconda Copper Co., and member of the Advisory Board of the Copper and Brass Research Association, on the promotion of an expanding future for copper, also are presented in their entirety in this issue.

A short but very interesting statement as to the purposes of and methods of procedure employed by the Bureau of Mines was made by Scott Turner, Director of the Bureau of Mines.

The difference in ease with which metals production can be stabilized as compared with the stabilization of bituminous coal production was emphasized by H. M. Chance, consulting mining engineer of Philadelphia. Mr. Chance asserted that the partial standardization of grades of bituminous coal has as yet had but small tendency toward stabilization either of prices or production. The effect of proper preparation of coal in increasing the value of the product will be a factor in future trend toward stabilization of that industry.

Under the general topic of "Taxation" one entire day was devoted to discussions of the several features of the taxation problems of the present. The sessions were opened after a visit had been made by delegates to the income tax unit of the Internal Revenue Department. It is the plan of The American Mining Congress to publish all these discussions in full in a separate booklet, soon to be ready for distribution. The ramifications of the tax question covered were many.



*J. T. Skelly, Elected Director of The American Mining Congress. Mr. Skelly is Vice-President in Charge of Sales of the Hercules Powder Company.*

Those referring to "Waivers, Credits and Refunds," as discussed by Walter A. Staub, of New York, and the "Discrimination Against Corporations Under Present Income Tax Rates," as discussed by H. B. Fernald, also of New York, appear in this number of THE MINING CONGRESS JOURNAL.

Referring to "Lurking Dangers in State and Local Finance," L. R. Gottlieb, economist, formerly of the National Industrial Conference Board, and formerly with New York University, pointed out the fact that of the total taxes levied in 1925 five-eighths were assessed by state and local authorities.

Mr. Gottlieb showed by charts that the increase in total taxes levied in 1890 was from \$875,000,000 in that year to \$8,363,000,000 in 1921 and \$8,132,000,000 in 1925.

The ratio of taxes to income, according to Mr. Gottlieb's chart, in 1913 was 6.9 percent, and in 1925 it was 12.5 percent, and at the same time there was a very great increase in the total of postponed taxes, such as bond issues. The state and local bonded indebtedness in that period increased from \$4,000,000,000 to about \$11,700,000,000 at this time, and the later bond issues were sold in a market that demanded a higher interest return.

Mr. Gottlieb's opinion is that it may be error to assume that all tax moneys are unproductive funds, for such expenditures as for good roads, police and fire

protection, health and sanitation and education are certainly not non-productive. Taxation's effect, in one way, is a redistribution of wealth, according to some economists, he said.

A. G. Mackenzie, secretary of the Utah Chapter, American Mining Congress, Salt Lake City, emphasized the value of taxpayers' associations in solving state and local tax problems. Such associations contribute directly to solutions through efforts for economy consistent with efficiency in the expenditure of public moneys, and this policy should be their controlling program, Mr. Mackenzie declared. One of the main achievements of such associations, according to Mr. Mackenzie, is the education of the taxpayers, and information prepared for such purpose also serves as accurate data for public officials, who welcome such assistance in most cases.

Remodeling of the entire system of internal revenue procedure was recommended by McKinley W. Krieh, chief of the Tax Division of The American Mining Congress. A scrapping in their entirety of provisions of the present law which should be properly left to administrative regulation, and their incorporation in a new law of provisions that will protect the taxpayer from administrative abuses, and at the same time protect the Government from loss of revenue through tax evasion, Mr. Krieh advised.

"As the Federal income tax system is one of self-assessment, the law should be shorn of confusing and complicated technical provisions. A new law should make possible accurate self assessment." In Mr. Krieh's opinion, internal revenue collectors should be vested with greater responsibility for the accuracy of returns as filed, and errors in returns corrected at the source. There is no reason, he said, why returns should be checked and rechecked, audited and re-audited and reviewed over and over again, unless the system is at fault.

In setting out facts concerning the functions and operations of the Board of Tax Appeals, J. G. Korner, Jr., chairman of the United States Board of Tax Appeals, said cases involving natural resources involve questions of fact, in which it is necessary to establish different sets of facts in each case. Such cases present great difficulty in founding proof, he said. March 1, 1913 values are almost always difficult of proof and discovery value presents many perplexities. Values of coal and ore in place are hard to determine, and so is uncut timber, as well as hydraulic power sites.

A perspective view of tax problems all



over the world, and their effect on American business, especially those tax problems that have to do with overlapping features of taxation, was given by Mitchell B. Carroll, chief of the Tax Section Division of Commercial Laws, Department of Commerce. The problems and complications of foreign tax laws as explained by Mr. Carroll were emphasized as a means of reassuring American taxpayers that tax diseases from which American business suffers are common to all the world and are not confined to the United States.

As a part of the tax sessions of the convention, a summary of 100 answers received to the recent questionnaire sent out by the American Mining Congress, including questions as to what is wrong with the Federal income tax system, was read by Dr. Henry Mace Payne, consulting engineer for the organization.

A review of the progress toward standardization in the mining industry was given by Col. Warren R. Roberts, chairman of the Standardization Division of The American Mining Congress. In his address, during the Friday morning session, Colonel Roberts sketched the organization of the division by enumerating its several committees, with their personnel, and information as to accomplishments reported by each subdivision in both the coal and metal mining branches. In the course of his paper, Colonel Roberts announced that a resolution had been approved by the division recommending to the American Mining Congress that all reports submitted to the American Engineering Standards Committee for approval, which have not reached a satisfactory stage of progress, be withdrawn. He advised the convention that the standardization division will soon decide which reports are to be so recalled.

On the subject of standardization, Dean E. A. Holbrook, of the State College of Pennsylvania, reported on the status of mining projects now before the Engineering Standards Committee. It was Dean Holbrook's conclusion that the A. E. S. C. offers a necessary and an orderly procedure for the nation-wide adoption of any standard, because of the interrelation of mining industry with other fields of industry.

The paper by Eugene McAuliffe, of the Union Pacific Coal Co., on "Reducing Operating Costs Through Mechanical Means" was particularly timely, in view of the announcement made in the December issue of THE MINING CONGRESS JOURNAL relative to a new mechanization plan calling for the services of an engineer, with which plan manufacturers and operators alike have agreed. Mr. McAuliffe's paper is presented fully in another section of this issue.

A decision to withdraw certain of its reports from the American Engineering

Standards Committee and after review issue them as standards of the American Mining Congress was reached by the National Standardization Division of the American Mining Congress in its conference held Thursday afternoon. Such action was made necessary, in the opinion of the committee chairmen and members making up the attendance, from the fact that reports made after long labors, and submitted to the American Engineering Standards Committee four years ago, have not yet been approved or acted upon. Only one report, that on safety rules for installation and use of electrical equipment in coal mines, has been passed by the A. E. S. C. in that time.

Other reports are in various stages of progress before the A. E. S. C., it was announced, but none definite enough to overcome the unfavorable effect of delay on work by the committees of the Standardization Division, who, it was pointed out, hesitate to continue their efforts as long as there is doubt about the reception of their earlier reports.

Much of the time of the Standardization Division conference was given over to discussion of the question of withdrawal from the A. E. S. C. Publication of the reports as standards approved by the American Mining Congress, but without the approval of the American Engineering Standards Committee, would not preclude the possibility of their later approval by the A. E. S. C. The action taken was without prejudice to the A. E. S. C., and the value of approval by such a national body was in no way minimized, but emphasis was placed on the need for releasing to the mining industry as soon as possible the fullest information on the standards approved by the Standardization Division, possibly as tentative standards for a year or two, and thereafter as approved standards.

Such criticism as was contained in the action by the division was toward the methods followed by several of the correlating agencies in forcing the submitting of all proposed standards to their entire membership before action by them can be made official. Such procedure means too much delay for the Standardization Division as regards mining standards.

The Standardization Conference heard reports from its several subcommittees during conference extending throughout Thursday afternoon, December 9, with Col. Warren R. Roberts, chairman of the division, presiding. Some of the committees had no reports, due to inactivity for many months, because of the fact that their earlier reports were pending before the American Engineering Standards Committee.

The report of Newell G. Alford, chairman of Subcommittee No. 3, Mine Timbering, on the use of concrete in mine

timbering, is printed on other pages in this issue of THE MINING CONGRESS JOURNAL. Other reports and summaries as submitted to the sessions will be printed in full in a booklet soon to be ready for distribution. These reports include that by Fred Norman, chairman of the Underground Transportation Committee, which was in the form of summary of returns on a questionnaire on mine-car design, as based on 29 answers to 85 questionnaires, which the committee did not wish to submit as conclusive, but only as a progress report. It was promised that the committee probably could make its report final early in the year.

In connection with the report of the Committee on Mining and Loading Equipment, Glenn B. Southward, engineer, recently employed in connection with the mechanization plan of that committee, was introduced, and announced that results of study of the activities of the committee would be ready for report in the near future.

It was announced that the standard under the title "Safety Rules for Installing and Using Electrical Equipment in Coal Mines," as approved by the A. E. S. C., was soon to be published in the Mines Hand Book of the American Mining Congress, and also by the Bureau of Mines as technical paper No. 402.

The reports submitted in full included that of Subcommittee No. 1 of mine timber grades, names, sizes and specifications, as read by D. F. Holtman, chairman of the committee. This committee suggested that steps be taken to arrange for representation of the American Mining Congress on the National Committee on Wood Utilization, and the suggestion was approved for recommendation to the Board of Directors of the American Mining Congress.

Another of the reports read in full was that of George M. Hunt, chairman of Subcommittee No. 2, on "The Preservation of Mine Timbers." This report, like others in the past, Mr. Hunt explained, was educational in character, because so few operators are using preservatives that no definite standard could logically be prepared. An increasing interest in the subject, however, has been noted.

Subcommittee No. 4, dealing with the use of structural steel for mine timbering, had no report to submit, but its chairman, J. D. Snyder, brought out informal discussion and much information as to the trend toward use of steel for such purposes was found for guidance in its future work.

A brief report of activity by Subcommittee No. 6 on reforestation was handed in by Chairman A. C. Silvius, indicating that there is a marked interest in the subject among operators, as shown by 25 replies to 55 questionnaires sent out.





*Banquet of the Twenty-Ninth Annual Convention*

Subcommittee No. 6 is a new committee and has had little time for activity since its completion in September of 1926.

Right in line with the mechanization program was the report of the purposes of and activities by the Manufacturers' Division of the American Mining Congress. This report was made by H. K. Porter, of the Hyatt Roller Bearing Co., chairman of the division. Mr. Porter detailed the results obtained from the annual exposition of mine machinery and equipment, held each year in conjunction with the annual convention of practical operating men, under the sponsorship of the American Mining Congress. He urged attendance at future shows and conventions of this kind by a larger proportion of the workers in the mines, particularly the foremen, superintendents, and others handling the equipment now in use or to be installed in mechanization programs.

Before adjournment of the sessions, on Friday, the work of Secretary J. F. Callbreath was praised, and he was called upon for remarks, to which call he responded by expressing appreciation for the support given to him, by the willingness of his associates to cooperate to the fullest for the common aims of the organization.

The Resolutions Committee, on which much of the labors of the convention were put, was made up of the following: A. R. Archibald, California, chairman; A. G. Mackenzie, Utah, secretary; J. W. Ady, Jr., Colorado; N. S. Greensfelder, Delaware; H. H. Miller, Idaho; H. W. Seaman, Illinois; Albert C. Dally, Indiana; A. D. Bryant, Missouri; Harold T. Edgar, New Jersey; Dr. A. F. Greaves-Walker, North Carolina; J. H. Sinclair, North Dakota; R. C. Allen, Ohio; Judge A. Scott Thompson, Oklahoma;

H. N. Lawrie, Oregon; Howard I. Young, Tennessee; Bruce P. Tyler, Virginia; W. E. E. Koepler, West Virginia; and Frank M. Smith, Washington.

Delegates and other guests were entertained on Thursday evening at a banquet in the grand ballroom of The Mayflower, where addresses were delivered by Senator Wm. H. King, of Utah; J. G. Bradley, of the Elk River Coal Co.; and Noah Swayne, of Philadelphia. Senator Tasker L. Oddie, of Nevada, was toastmaster. In addition to vocal solos by Flora McGill Keefer, well-known Washington artist, accompanied by George Wilson, of Washington, musical selections were offered by The Mayflower Orchestra.

Senator Oddie described the American Mining Congress as an institution that has brought together the ablest engineers and the most successful operators of this country. He advocated enlarged work by the Bureau of Mines and the United States Geological Survey along lines of scientific and practical mining economics.

Senator King unqualifiedly opposed governmental control of coal mines and other industries. He predicted the loss of vitality by states and individuals if the trend toward centralization of government has not ceased in the next 50 years. He commented with enthusiasm on the returns received by the American Mining Congress on its questionnaire concerning public questions, including taxation. The almost unlimited mineral resources of Utah were pointed out by Senator King, who said there was enough coal in that state to heat the world for generations, and that the iron ore of Utah would some day compete with that of Pennsylvania and Alabama.

Noah Swayne emphasized the importance of freedom of contact between employer and employee. His address con-

tained many epigrams of serious nature, but mainly was a round of humor and wit with which the guests were greatly pleased.

The convention closed with the Friday morning session, at which W. H. Lindsey presided. In addition to the addresses and the report of the Resolutions Committee, comment on the value of the work of the American Mining Congress in the South, in view of the great mineral reserves there, was made by H. H. Wilhoit, industrial agent of the Southern Railway.

The following resolutions were adopted:

*Resolution No. 1*

**HYDRAULIC MINING IN CALIFORNIA**

WHEREAS the Hydraulic Mining Commission of the State of California has now in preparation a report outlining a feasible plan for the resumption of hydraulic mining in that state under the provision of the California Débris Commission act (Caminetti Act of 1893); and

WHEREAS this is a Federal act controlling the operations of hydraulic mines on the tributaries of the Sacramento and San Joaquin Rivers—its chief object being the protection of these navigable channels; and

WHEREAS under the act the California Débris Commission is empowered and directed to construct dams for the impounding of mining debris; and

WHEREAS the plan now being formulated by the California Hydraulic Mining Commission necessitates the construction of dams by the Débris Commission, appropriations being asked from the state of California and the Federal Government; and

WHEREAS the cost of construction and maintenance of these dams will be repaid by the mines under the provisions of the California Débris Commission act, which stipulates a payment of 3 percent of the gross output of each and every mine operating behind said dams; and

WHEREAS investigations show between 800,000,000 and 1,000,000,000 cubic yards of gravel that would have a yield of from \$100,000,000 to \$125,000,000 by the construction of dams; and

WHEREAS the engineers of the California Débris Commission are now engaged in estimating the capacities and costs of said dams for the information of the California Hydraulic Mining Commission and the Federal Government; and

WHEREAS the resumption of hydraulic mining in the state of California will greatly increase the production of gold and stimulate and encourage the gold-mining industry of the West: Now, therefore, be it

*Resolved*, That this meeting of the American Mining Congress, held at Washington on the 8th day of December, 1926, records its desire to assist in the solution of this important economic problem.

#### Resolution No. 2

##### USE OF SILVER FOR COINAGE

WHEREAS the continued desire of an increasing number of nations for the adoption of a gold standard is bringing about such a demand for gold that prices, as measured in gold, will decline on a world-wide scale; and

WHEREAS the history of the world's use of the precious metals, gold and silver, shows that when the demand for one metal becomes too great the other can be called upon to assist in the work it has to do as a measure of value; and

WHEREAS, in view of the increasing demand for gold as a standard of value and the decreasing output of that metal, the time is here when an increased use of silver as subsidiary coinage should be promoted by all means in our power: Be it

*Resolved*, That the officers of the American Mining Congress be directed to call this condition to the notice of the President, Congress, the Secretary of the Treasury, and take such other steps as will, in their opinion, conduce to the increased use of silver for coinage.

#### Resolution No. 3

##### NATIONAL MINE SAFETY COMPETITION

WHEREAS the statistical information made available through the National Safety Competition conducted by the United States Bureau of Mines is of inestimable value in directing accident prevention efforts throughout the mining industry: Therefore be it

*Resolved*, That the National Safety Competition should, for both economic and humanitarian reasons, be conducted on a scale adequate to fully meet any call made upon it by the mines and quarries of the United States, and the American Mining Congress reiterates its indorsement of the activity of the Bureau of Mines.

#### Resolution No. 4

##### ADDITIONAL FUNDS FOR OIL SHALE INVESTIGATIONS

WHEREAS the Congress of the United States has made an appropriation for the equipment of an oil shale research plant to be operated by the Bureau of Mines, which plant is now ready for operation, and an appropriation for the

operation of said plant until July 1, 1927; and

WHEREAS it is believed by this organization that one year is insufficient time for the solution of the important problems involved in the development of this vast potential, industrial and defensive resource of the United States: Therefore be it

*Resolved*, That the American Mining Congress hereby expresses its hearty appreciation of the action of the United States Congress in providing the said appropriations, and hereby requests that such additional funds as are necessary be provided to enable the Bureau of Mines to continue said research work on the expiration of the year now provided for.

#### Resolution No. 5

##### SCHOOL LAND GRANTS

WHEREAS the western land grant states of Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, North Dakota, Oregon, Utah, Washington, and Wyoming have been granted certain lands by the Government for the benefit of the common schools and institutions of higher education; and

WHEREAS by the terms of a number of these grants, and by judicial construction and departmental rulings as to the balance, the mineral rights in the lands granted have been retained by the Government; and

WHEREAS the surface rights of much of the lands of these grants are of little or no value and contribute only in small part to the cost of education in the various states; and

WHEREAS the principal object to be attained by these grants will be defeated unless the mineral rights are relinquished to the states: Therefore be it

*Resolved by the American Mining Congress*, That the United States should relinquish to any state or territory all right, title and interest of the United States to the lands, irrespective of their character, granted to such state or territory, for the support of or in the aid of common or public schools.

#### Resolution No. 6

##### MINING IN NATIONAL FORESTS

WHEREAS a large part of the undeveloped mineral resources remaining in the Western States are situated on lands covered by national forests; and

WHEREAS the laws provide for free access to the national forests, as to other parts of the public domain, for the purpose of prospecting and development of minerals thereon; and

WHEREAS there exists a widespread feeling among the miners and prospectors of the Western States that the policies adopted by the administrators of the national forests look to their permanent control by the Federal Government and are prejudicial to the free development and appropriation of the minerals thereon as by law provided: Now, therefore be it

*Resolved by the American Mining Congress*, That the mineral lands contained in the national forests should remain open for location, appropriation and use, under the existing laws, and that the Forest Service should endeavor by all means in its power to facilitate and encourage such location, appropriation and use, subject only to such general restrictions as may be necessary to protect

the woodlands and watersheds from damage and destruction; and be it further

*Resolved*, That in case of objection being raised, on behalf of the Forest Service, to any mineral appropriation or claim on the public domain, during pendency of proceedings for patent or otherwise, the Department of the Interior should proceed to ascertain through a referee or referees of unquestioned ability and experience, who shall command the confidence and respect of miners and prospectors, both as to their knowledge of mines and their integrity, and without expense to the claimants, the facts concerning the appropriations or claims in question, so that the rights of the locators thereof shall not be prejudiced by objection raised on behalf of the Forest Service; and be it further

*Resolved*, That rights of way for water, power, transport of ore and other purposes necessary to the development or operation of mines should be freely granted, subject only to such charges or to such conditions as shall be necessary to compensate for damage done or to be done to said forest, or to provide for safeguarding of the woodlands thereon; and be it further

*Resolved*, That copies of this resolution be presented to members of Congress with the request that they cooperate to bring the intent of this resolution into actual operation and effect.

#### Resolution No. 7

##### STOCK-RAISING HOMESTEAD ACT

WHEREAS the Department of the Interior has indicated through its Secretary that it will ask for the repeal of the 640-acre or stock-raising homestead act; and

WHEREAS well-known mineral areas have been thrown open for entry under said act, and many stock-raising homesteads have been granted upon mineral lands; and

WHEREAS, even though the provisions of said act provide for the prospecting for and mining of minerals contained in the areas covered by the said stock-raising homesteads, in practice the effect of said act is to eliminate the lands so entered from any further mineral development; and

WHEREAS the entering of stock-raising homestead entries upon mineralized areas has curtailed, if not entirely stopped, all mineral development in said areas: Now, therefore, be it

*Resolved by the American Mining Congress*, That we indorse the suggestion of the Secretary of the Interior that the act be repealed, and if the act is not repealed, but amended, that it be so amended that all areas known to be mineral in character, but otherwise subject to entry under said act, be permanently withdrawn from entry under said 640-acre homestead act, and that on all other lands entered and patented under said act the mineral rights shall pass to the patentee in fee.

#### Resolution No. 8

##### POTASH INVESTIGATIONS

WHEREAS the act approved June 25, 1926 (Public, No. 424, 69th Congress), authorizing the Secretary of the Interior and the Secretary of Commerce jointly to determine the location, extent, and mode of occurrence of potash deposits in the United States and to conduct labora-



The Mayflower Hotel, Washington, Where the 29th Annual Convention Was Held

tory tests requires the departments named to negotiate contracts with owners or lessees of lands within a radius of 1 mile of any proposed drilling site before any drilling may be started; and

WHEREAS these contracts require said landowners or lessees to reimburse the Government for the cost of exploration, regardless of whether potash is discovered by such exploration, and place restrictions on the sale of land and mineral rights affected by these contracts, and of potash that may be produced therefrom; and

WHEREAS the areas most favorable for potash exploration are selected, and drilling sites are designated, by the United States Geological Survey, and the negotiation of contracts and supervision of drilling operations is assigned to the Bureau of Mines; and

WHEREAS it has thus far been impossible for the Bureau of Mines to obtain signatures to contracts containing the aforesaid provisions, so that desirable areas in Texas, as designated by the Geological Survey, have thereby been necessarily excluded from consideration as drilling sites under the act: Be it therefore

*Resolved*, That the American Mining Congress hereby expresses its disapproval of the restrictive clauses of the act as now constituted and urges upon the Congress of the United States that all restrictions for reimbursement be removed.

#### Resolution No. 9

#### REPEAL OF THE STOCK TRANSFER TAX

WHEREAS the Federal stamp tax on the issue or transfer of shares of stock is a war emergency tax and a nuisance tax that falls inequitably upon different stock transactions; and

WHEREAS it is discriminatory and burdensome to small mine development companies that must issue small shares, and is oppressive not only to mine development companies but to all small companies engaged in the financing and undertaking of any new project or pioneer development; and

WHEREAS the revenue produced by it is comparatively insignificant from the Government's standpoint, and there is no longer any justification for its continuance: Therefore be it

*Resolved*, That Congress be urged to immediately repeal the stamp tax on issues or transfers of stock certificates.

#### Resolution No. 10

#### CORPORATE INCOME TAX REDUCTION

WHEREAS the present corporation income tax rate of 13½ percent is excessive and discriminatory against the corporate form of business as compared with the partnership or individual form; and

WHEREAS the commutation of the capital stock tax into an increased income tax from 12½ to the present rate of 13½ percent aggravated the inequalities that already existed by placing an added burden upon enterprises in corporate form and increasing the differential taxes already imposed on corporations as compared with individuals and partnerships; and

WHEREAS it has been demonstrated that the increase of 1 percent in the corporation rate was not necessary by the fact that a Treasury surplus of approximately \$400,000,000 will be accumulated during the present fiscal year; and

WHEREAS there is no necessity or demand for further individual tax relief, but corporate tax relief would benefit directly from 12,000,000 to 20,000,000 corporate shareholders: Therefore be it

*Resolved*, That Congress be urged to repeal the additional 1 percent imposed on corporations by the revenue act of 1926, and to grant such further relief as the fiscal situation of the Treasury may permit.

#### Resolution No. 11

#### WAR MINERALS RELIEF LEGISLATION

WHEREAS widespread dissatisfaction exists among claimants over the administration of the war minerals relief act of March 2, 1919, and its amendments; and

WHEREAS the American Mining Congress believes that every citizen is entitled to his day in court to have his rights judicially determined: Now, therefore, be it

*Resolved*, That the American Mining Congress favors legislation by Congress that will grant such right to war minerals claimants, and such further legis-

lation as will speedily and effectively enable the Federal Government to justly and equitably and finally dispose of all war mineral claims.

#### Resolution No. 12

#### FUNDS FOR BUREAU OF MINES AND GEOLOGICAL SURVEY

WHEREAS the United States Bureau of Mines and the United States Geological Survey are performing splendid services for the mineral industries, the value of these services being greatly in excess of their cost; and

WHEREAS the lack of proper funds is seriously hampering their accomplishments by preventing attention to meritorious investigations and by delaying the publication of the various reports by the Government Printing Office: Be it therefore

*Resolved*, That the Government should make possible by adequate appropriations and other provisions the completion of manuscripts, etc., and the publication of the various reports of the Bureau of Mines and the Geological Survey in time for them to be of maximum value, and the expansion of the activities of these organizations in keeping with the just requirements of the mineral industries.

#### Resolution No. 13

#### STUDY OF DEPRECIATION IN THE MINING INDUSTRY

WHEREAS the Bureau of Internal Revenue has issued a pamphlet outlining a plan for a study of depreciation and maintenance, with a view to setting up standard rates of depreciation, and in connection with this plan has prepared elaborate and voluminous schedules on which taxpayers in the several industries will be asked to furnish comprehensive facts and data concerning the depreciable property and maintenance thereof in such industries; and

WHEREAS it is understood that these schedules will be sent in due course to each of the several branches of the mining industry, and they will be asked voluntarily to furnish, as completely as possible, the data and information outlined; and

WHEREAS the preparation and completion of these schedules, to the extent which available records and information might permit, would, in the case of the major portion of the mining industry, entail the employment of large additional accounting and clerical staffs at great cost for a very considerable period of time, particularly if prompt compliance is necessary or desired, and would impose an unusual and excessive burden upon this industry for a purpose that appears to the mining industry to be of doubtful practical value on account of the wide variance of conditions as between individual operating units; and

WHEREAS, while compliance with this plan is said not to be compulsory but entirely voluntary, the several branches of the mining industry do not wish either to ignore or refuse to comply with the request for these data and information required by such schedules, whereby failure of cooperation or other criticism might be alleged: Therefore be it

*Resolved*, That the Tax Division of the American Mining Congress is hereby authorized and instructed to bring this situation to the attention of the Commissioner of Internal Revenue and to urge the (Continued on page 36)



# GROWING TENDENCY TOWARD CENTRALIZATION OF GOVERNMENT IN WASHINGTON\*

*Our Government Itself As Well As Individual Initiative And Enterprise Can Be Broken Down By Over Expansion Of Governmental Activities—States Must Assume Their Responsibilities—Governmental Encroachments Usually Brought About By Popular Clamor—Federal Activities Insufficiently Coordinated*

I AM always glad to meet the members of the American Mining Congress. Many years as a miner have given me that attachment to the mines which comes to all those who have engaged in it.

I see that on your program I am listed for some discussion of centralization and over expansion of Government. I have prepared no formal address for this occasion. I need not apologize for the volume of work which has prevented me from preparing such a presentation as I should have wished. I am aware that that is a matter of a great deal of interest to the mining industry; in fact, it is a matter of fundamental interest to all business, and in its consideration I have often thought that we need a little exploration into the causes that bring about the centralization in our Government, with a better understanding of what the business public can or can not contribute to that situation apart from their primary function as voters.

So far as I know there is but a small negligible group who propose to defend a further centralization of our Government in the sense that Government shall extend its control over business, or who believe in it in theory. Paradoxically there are, however, great multitudes of people anxious that the Government intervene in various parts of our economic machinery. And any one of those folks will quite violently oppose centralization of government as a theory. So I do not have to argue the theory of why our democracy is little adapted to centralization; that our form of government can be broken down by over expansion of activities. Moreover, it can break down the most vital thing in American life—the initiative and enterprise of our people. One thing of great interest is: Why and how it comes about that our Federal Government does get perceptibly more extended and consequently more centralized from year to year.

The first of the causes is the unwillingness of the states to accept their responsibilities under our form of federated government. Hundreds of problems require public interest and public attention through government; they always arise by conflict, and the more bitter the

By HON. HERBERT HOOVER †

conflict the more our state officials shirk the responsibility and the more naturally that the burden is thrown up to the Federal Government.

The next of these causes is a corollary of this in that although a majority of the states assume their responsibilities some states fail to do so and then even the



Herbert Hoover, Secretary of Commerce

majority of states insist upon action by the Federal Government in order that the minority may be compelled to fall into line.

A profound instance of that character is the child labor legislation, where probably more than half of our states were performing their obligations in that particular, and the delinquent states impose an economic burden upon the majority by failure.

There is another cause which I believe is probably the most profound of all in the expansion of Government whether state or national. That is the failure of our business world itself to recognize its social or economic responsibilities. I do not believe that you can search through the great measures of expansions of the

Federal activities into regulation of business without being impressed with the fact that it arose from public indignation at practices which had grown in our business world.

If you will go back to the period of the Sherman Act or to the period of railway regulation, you will agree that in the light of today they were brought about by practices which we now universally condemn. That legislation would never have come about had it not been that there was a very considerable public grievance. And all the agitations that I see that come to Washington, come up in the form of a public grievance at some line of activity that has more or less failed in solving problems of profound public interest. Moreover, we have the curious situation in Washington that the most of the proposals for expansion of Government into business, into industry and commerce, either in regulatory or other fashions, arise from the business men themselves who believe they are suffering from grievance that is incurable except by legislation. I can not recall a single instance of these actual extensions of government authority, or proposals of its extension that have not been supported by some section of the business community itself. That particular section comes to Washington with the belief that it is suffering some kind of injustice, and that something ought to be done to save them from difficulties of some sort or other. So that we have this curious complex: That the Government seldom if ever enters upon an expansion of its functions into the business world until the impetus for action comes from the business world itself.

And that brings me to this conclusion: That the business world needs a certain amount of education as to the fundamental results of this sort of fractional and sectional pushing against the other; that unless our business folk on one side are willing to cure grievance, to cooperate, to solve the difficulties which are imposed upon other sections, and unless the business world which suffers is prepared to fight out their grievance in their own ranks, I see no other situation than the constant pressure in Washington for further and further expansion of Federal activities.

We have many instances in the past few years where cooperation in the busi-

\* Address delivered before Twenty-ninth Annual Convention, The American Mining Congress, December 7, 1926.

† Secretary of Commerce.



ness community to relieve these pressures and the pressure of public grievance has removed the danger of on-coming interference of government. I could cite the anthracite industry and the lumber industry as examples of such sound cooperation.

I, of course, do not include in objectionable expansion of government those activities of a promotive order—scientific and economic investigations and cooperation with various sections of the community to secure voluntary improvement of one kind or another. Nor do I include those large measures of waterway, highway and other public improvements which can not be undertaken by private enterprise.

We have another serious difficulty in government that perhaps is rather remote from the direct subject, and that is the lack of proper organization of the Federal Government. If you make any study of our Federal activities, you will find that, roughly, we maintain here in Washington some 120 different functions of one kind and another under separate headships. You will find that some 20 of them, as I recollect, lie outside the departments and comprise what we call the independent agencies. You will find that there is a sad lack of logic in the grouping of these functions. We have many different departments, different bureaus, different agencies of the Government engaged independently in functions of the same or related major purpose.

As an illustration I may refer to the Department of Commerce and therefore can not be construed as a criticism of other departments. There are, I think, some 13 different functions in the Government concerned with the merchant marine, excluding the Shipping Board. Some seven or eight of these functions are in the Department of Commerce, and the balance of them are distributed over some seven different departments and agencies of the Government. So that an American ship entering an American port must come into contact, in relation to the merchant marine questions, with eight different departments of the Government and 14 different agencies. The master mariner naturally runs that gauntlet in coming in, and then finds that he has to run the same gauntlet in order to get out again.

Those particular functions are not expensive from a governmental point of view. I do not presume that the total appropriation to conduct them all runs into more than \$20,000,000 a year (and they are all necessary services), but the expense imposed upon the ship owner and the captain of the ship is very considerable because of the division of contacts and overlap in functions. The expense imposed upon the merchant

marine itself, due to lack of our internal organization, is probably half as great as the expenditure of the Government itself in the maintenance of those functions. Now the tendency of every government function is to grow—to grow not only with the growth of population but to expand the borders of its activities. If we had the courage and the logic of mind to bring all functions of the same major purpose together we would clip these expansions and overlaps greatly. We would automatically limit the tendency toward expansion, and in any event one result would be to further curtail the points of contact with the American public and that the American business folk have to have with the Government.

We have debated that question for some five years, and yet it is a matter so obscure in its relationship to the public that we have never secured any great public support for it. In the enormous burden that Congress must carry in considering some 15,000 bills per annum, the cases which do not have much public support necessarily must be put in the background.

In this relation of government functions there is another phase worth consideration. When the Government was founded there was a very wise separation of the functions into three well-known branches; in fact, that was the essence of our new experiment in government construction. In that division of functions it was fundamentally considered that in administration, executive matters must be under single-headed responsibility; that questions of legislation required many minds representing many branches of thought and many sections of the country, with large and extended debate and extensive deliberations; that the judicial function likewise required the ultimate revision by many minds, through a series of courts, with appeals from one branch to another, and so on; in fact, a function requiring the common judgment of a number of men.

We have, in other words, the judicial functions, under the original conception of government, being determined by several minds. We have the legislative conclusions in the hands of a number of men. And under that same conception we were to have administrative and executive work under a single head with a single responsibility.

That is, indeed, the most perfect conception of government in its fundamental structure that had been evolved to that date, or even down to this. But almost from the day that that structure was erected we started in to corrupt it by mixing these functions, and we still do it. We have placed semi-legislative functions in the hands of single individuals; we have placed semi-judicial functions likewise in the hands of single indi-

viduals, and more especially are we prone to put administrative and executive functions in the hands of several people in the shape of boards and commissions.

That mixture of the fundamental conception of the Government is not only inefficient but is probably one of the most wasteful features of our system, and its waste is not only in its own operation but in the burden it imposes on our people in their personal relations to their Government. It runs in obscure directions and in difficult paths; and if one were to analyze what happens to the citizen—the extra expense that he is put to, the extra trouble, and the difficulties he is under by that complexity and change of the fundamental governmental structure—we would find it amounts to no inconsiderable sum. Every business man will agree that you can not administer business through a collection of minds, even though they be a collection of geniuses; and no business man wants law or judgment imposed upon him by a single mind.

I do not need to argue with you on the abstract question of centralization of Government. No one has been more opposed to it than I have. To review what has happened in European democracy during the last eight years: At the beginning all of Europe awoke in hope and aspiration that democracy offered the solution to their burdens of human conflict and their problems of human relation; yet at this moment probably one-third of European democracy has directly or indirectly abandoned it for some form of dictatorship. And if you examine the reasons of this abandonment one of the reasons which would loom large would be that they so overloaded and so centralized their government that they paralyzed its ability to govern. There are other reasons why their democracies have failed, but if you analyze any one of these failures you will find that this cause has been one of the chief, and perhaps the chief cause of failure.

The Michigan College of Mines at Houghton, will ask the Michigan State Legislature to appropriate a total of \$75,000 to be used by the Geological Survey of the state and the College of Mines in further research work concerning both copper and iron. This research work will be directed to the finding of the best and most efficient methods of discovering new ore bodies and the development of methods of making merchantable ore from the low grade materials. This appropriation has been divided up to including \$10,000 to the Geological Survey for publication purposes, \$15,000 for the Survey to expend in gathering information needed to promote prospecting, and \$50,000 per year for the College of Mines to be expended in developing methods of utilization of Michigan low grade iron and copper ores.

## A STABILIZED MINERAL INDUSTRY\*

*By Stabilization Is Meant A Common Sense Adjustment Of Supply And Demand—Reduction Of Peaks And Depressions May Be Accomplished Through Uniformity Of Price—Progress Along This Line Has Been Made*

By ROBERT E. TALLY †

**S**TABILIZATION of the mineral industry is a common sense adjustment of supply and demand. It aims toward uniformity of prices, thereby reducing the peaks and depressions from which the mineral industry has long suffered, and aims toward a price basis which will represent a fair return upon the producers' investment and the risk involved, and a price which will at the same time encourage the increased consumption of metals.

Considerable progress has been made toward stabilizing the prices of lead and zinc on the basis comparable to general index prices, but the results obtained to date as concerns copper, gold and silver are far from satisfactory. The price of copper from January, 1923, to date, is approximately 5 percent lower than the 20-year pre-war average. The present price of silver is correspondingly below the pre-war average, while gold has maintained a uniform price in the face of the general increase in index prices.

The war and post-war costs of producing gold have increased to such an extent that gold mining in general is no longer attractive, and there remains no great incentive for finding and developing new gold mines where the price obtained for gold does not allow a reasonable return on the investment and risk involved.

A large percentage of the world silver is produced as a by-product of copper, lead and zinc. This represents an unfortunate condition for the strictly silver mines, particularly when there is a large demand for the associated metals. The price of silver had become fairly stable at a price range of 60 to 65 cents per ounce, when the recent recommendation of the Royal Commission on Indian Currency and Finance to place India on a gold basis resulted in a drastic decrease in the price of silver.

In the case of copper, unreasonable high prices will encourage the use of substitutes and reduce consumption, while low prices tend to make mining unattractive from the standpoint of investment.

Both conditions are unhealthy. An actual shortage of metal is the only excuse for excessive prices, and this condi-



Robert E. Tally

tion does not exist. Continued low prices will discourage mining to the extent that the United States will become increasingly dependent upon low cost foreign production, an unfavorable position for an industrial country.

Overproduction is primarily responsible for low prices, while unsystematic marketing, high costs and lack of refining and manufacturing facilities by the primary producers are contributing causes to the unsatisfactory present returns on the copper mining investments.

Overproduction has developed from the overcapacity created by the sudden and excessive war demands, with correspondingly high prices. These conditions stimulated the development of new mines and the expansion of older ones, with the result that the industry had an excessive high-cost capacity for post-war conditions and consequently suffered a severe de-

pression for several years following the war.

Such improvements as have been made in the situation since that time have been due almost entirely to the development of increased demand, supplemented by successful efforts to reduce costs. This adjustment has not been carried far enough as concerns copper.

The natural remedy for excess production is curtailment in accordance with demand. While this treatment appears simple, the difficulties preventing a practical solution for this problem have to date appeared unsurmountable. These difficulties are due to the fact that collective curtailment is illegal; that individual curtailment will increase costs and may reduce profits if it is not more or less general; and if general, the producers may be accused of acting in restraint of trade, thereby subjecting themselves to embarrassing publicity.

The copper producers have not curtailed production to an extent sufficient to maintain reasonable prices, with the result that copper is still selling below pre-war prices, while wages and most other large cost items are 40 percent higher than before the war.

The general prosperity of the United States, augmented by the efforts of the Copper and Brass Research Association, is responsible for the largest consumption of copper in the history of the country. European consumption continues low. The natural growth of this country, together with expected industrial improvements in Europe, will sooner or later absorb the excess productive capacity of the industry.

Many of the mines have been able to reduce costs to a basis comparable with pre-war costs. These reductions are due to large scale production; to the merging of individual mines into large units, improved methods, elimination of waste, standardization, manufacturing and general increased efficiency.

Additional mergers will no doubt be effected and further and important cost reductions are possible by cooperative refining and (Continued on page 50)

\* Paper presented to Twenty-ninth Annual Convention, The American Mining Congress, Washington, D. C., December 8, 1926.

† General Manager, United Verde Copper Company.

## THE LEAD INDUSTRY IN 1926\*

*While Production Has Increased Steadily The Industry Is Faced With Necessity Of Discovering New Deposits Should Demand Continue To Increase—United States Consumes All Lead It Produces—Tariff A Necessity To Prosperity*

By FRANK M. SMITH†

THE production of lead in the United States and likewise the world production have been steadily increasing since the war. To go back only five years, the figures in Table I quoted from the American Bureau of Metal Statistics will show the trend of production which is given in tons of 2,000 pounds.

The gradually increasing price of lead each year, as shown above, was responsible for bringing about this increased production. For 1926 the price of lead will average somewhat lower than for 1925, and it remains to be seen whether this will cause a corresponding reduction in the production. In a general way the production has increased with the price, and probably will continue to do so, up to a certain limit which at present is the maximum capacity of the known mines to produce. If the demands for consumption exceed the production the price will advance and thus stimulate more production which can only come about by the discovery of new deposits of lead ores and the mining of ores of lower grade which heretofore have not paid to mine.

That the consumption of lead in the United States has been steadily increasing is well known. Again quoting from the American Bureau of Metal Statistics, Table II shows in tons the amount of lead used in various industries during the past five years. The figures include primary and secondary lead, antimonial lead and likewise manufactured lead for export (bonded).

The above figures indicate a slight falling off in the use of white lead for 1925, as compared with previous years—even with 1921. Oxides show a small increase, as do the amounts used for building, bearing metal, foil, solder and calking. By far the largest increases are shown in the manufacture of storage batteries and lead-covered cable, which two industries consume nearly 40 percent of the total lead used in the United States.

Because the consumption and the production of lead are approximately in balance, the price of lead is very sensitive, and in consequence we have had violent fluctuations from year to year since the war and usually two or more upward- and downward movements during each year. Prior to the war the average price for twenty years, or even thirty years, was under 4.5 cents per pound. The war

years naturally created an enormous demand and prices rose rapidly from an average of 3.86 cents in 1914 to an aver-



Frank M. Smith

age of 4.67 cents in 1915, 6.57 cents in 1916, 8.78 cents in 1917, and then declined to 7.14 cents in 1918, and 5.76

cents in 1919. Prices as high as 10 cents and 11 cents obtained during some months in 1917, and as low as 4.08 cents in March, 1921. These price changes are very unfortunate for the industry, which in this respect is in no different situation than many other of our industries, where the price of their products is dependent upon the old law of supply and demand.

What is a fair price for lead under present operating conditions? Many assume that at present prices the lead producer is basking in the sunlight of prosperity. At this writing the price appears to be fairly stable at eight cents per pound, and I think it can be stated that this price is satisfactory and fairly profitable to the larger producers. At this price the medium grade ores can be mined, and a profit made which is fairly comparable with the profit made at pre-war prices, because the higher operating costs now prevailing about offset the high prices. Wages have increased about 60 percent as compared with pre-war conditions. Supplies used in mining have all increased in price, so that essentially an 8-cent price is needed to offset the increased mining costs.

The price of silver has a very direct bearing on the profits of the argentiferous lead mines of the West. If we assume that the average shipping products—crude ore and concentrates—have a silver content of thirty ounces per ton, a decline in the silver price of 10 cents per ounce, such (Continued on page 60)

Table I

Country	1921	1922	1923	1924	1925
United States .....	402,749	470,000	530,000	590,000	662,500
Canada .....	34,381	45,842	53,899	86,583	126,994
Mexico .....	66,581	133,180	184,242	177,697	205,159
Total North America.....	503,711	649,022	768,141	854,280	994,653
South America .....	5,141	6,547	5,600	15,700	22,988
Europe .....	318,289	314,705	318,116	357,705	376,414
Asia .....	50,395	53,441	55,758	66,837	61,874
Australia .....	63,071	118,064	137,364	140,645	165,634
Africa .....	33,719	37,419	28,097	23,958	18,382
Grand Totals .....	974,326	1,179,198	1,313,076	1,459,125	1,639,945
Average N. Y. Price (E. and M. J.)..	4.545c	5.734c	7.267c	8.097c	9.02c

Table II

Purpose	1921	1922	1923	1924	1925	Pct. of Total 1925
White lead .....	136,000	156,000	190,000	150,000	131,000	15.5
Red lead and litharge.....	23,500	30,000	46,000	34,000	42,000	5.0
Storage batteries .....	87,000	130,000	143,000	170,000	180,000	21.4
Cable covering .....	67,000	93,000	131,000	138,000	147,000	17.5
Building .....	48,000	71,000	75,000	83,100	88,400	10.5
Ammunition .....	26,500	36,500	39,000	26,500	28,000	3.3
Foil .....	23,800	26,800	33,300	35,000	32,500	3.9
Bearing metal .....	21,000	26,000	28,000	32,000	34,000	4.0
Solder .....	12,000	20,000	30,000	30,000	35,000	4.1
Calking .....	12,000	15,000	15,000	15,000	18,000	2.1
	456,800	604,300	670,300	713,600	735,900	87.3
All other uses.....	63,750	77,350	96,700	98,050	107,150	12.7
Totals .....	520,550	681,650	767,000	811,650	843,050	100.0

\* Paper presented to 29th Annual Convention, The American Mining Congress, Washington, D. C., December 7-10, 1926.

† Smelter Director, Bunker Hill and Sullivan Mining and Concentrating Co.



# IRON ORE—THE STATE OF THE INDUSTRY\*

## *The High Grade Lake Superior Iron Ores Will Probably Be Exhausted In Little More Than Generation—Nineteen Twenty-six A Most Satisfactory Year From Production Standpoint—A Brief Review Of The Industry*

By R. C. ALLEN†

IT IS very difficult to discuss intelligently the subject of iron ore apart from the general industry of iron and steel—difficult to give an adequate description of the foundation of a building without also making some remarks about the superstructure. Forty years ago there was an iron-ore industry, but today blast furnaces, mills, lake shipping, and mining constitute for all practical purposes a single integrated industry linked by amalgamation of financial control. But for the purpose of this program it is necessary to assume that the business of the iron miner ends at the docks in lower lake ports where the ore is delivered to the furnace interests and whereon the prices are based.

Based on the operations of 1926, you may consider that about 25,000 men are engaged in the Lake Superior region in mining, hoisting, and loading on railroad cars 60,000,000 tons of iron ore from seven different principal producing ranges or districts in the States of Minnesota, Michigan, and Wisconsin. The ore is transported from the mines over 11 railroads to 22 receiving and loading docks, of which 18 are on Lake Superior and 4 are on Lake Michigan. From these docks about 97 percent of the ore is transported to lower lake ports in about 335 vessels employing 10,000 sailors; the remainder is shipped all rail to furnaces. The vessels have an average carrying capacity of about 8,500 tons on a 20-ft. draft of water, but an actual capacity at the present time of considerably less on account of the lowering of the levels of the Great Lakes through the operations of the city of Chicago and natural causes. The ore is delivered to the railroads and lake-front furnaces over unloading docks numbering, I think, about 36. From these docks it is transported to about 235 blast furnaces, mainly in the St. Lawrence and Mississippi Valleys, making pig iron at the average rate of about 14,000 tons per month each.

It may help you to visualize the magnitude of this movement when I say that if all of this ore were loaded into standard cars carrying 50 tons each, in a single train, the caboose would be 6,800 miles behind the engine. It would occupy a double track extending from New York to San Francisco. It would require a solid line of vessels of the average carrying capacity of 7,500 tons, extending from Duluth, through Lake

Superior, the St. Marys River, and Lake Huron to Detroit, in order to float this ore. The ore-carrying fleet also transports, as a complement of the iron-ore movement, about 46,000,000 gross tons of coal, grain and limestone, and to provide bottoms for this additional tonnage it would be necessary to extend the solid line of ships from Detroit on to Buffalo and over the falls of Niagara. The



R. C. Allen

smelting and fabricating of this ore requires the labor of at least 500,000 men whose earnings support probably 2,000,000 people, without including those engaged in transportation of other raw materials and the finished products of the iron industry. The importance of iron mining in the Lake Superior region to the country is further emphasized by the fact that 85 percent of all of the iron ore produced in the United States originates in Lake Superior mines, of which there are about 200, producing this year an average of 300,000 tons each.

Time permitting, it would be interesting to trace the early development of the iron industry on the Atlantic coast and its movement across the mountains westward into the Mississippi Valley and the Great Lakes basin, following the discovery of Connellsville coke and the surpassing richness and volume of the ores of Lake Superior. It would

be of interest also to speculate on the probable future backward movement from the great valleys toward the Atlantic coast, for geologists do not believe that Lake Superior will be able to continue to produce indefinitely 60,000,000 tons annually of high-grade iron ore, except on the assumption that means will be found of beneficiating certain types of low-grade ores that are not susceptible of treatment by any known method. Careful estimates show that there is available in the Lake Superior region iron ore of the average shipping grade today (about 51 percent metallic iron natural) in the amount of not more than 2,500,000,000 tons, including the ores susceptible of concentration by known methods at moderate cost. If future demands for this ore are no greater than now, this high-grade ore reserve will be exhausted in the next generation. The economic effect of approaching exhaustion will begin to be felt before 20 years have elapsed. Here is a major problem in economics. It is not considered probable that Lake Superior reserves will be augmented beyond the figures stated, except through the development of some means of concentrating at low cost low-grade rock consisting essentially of the hydrated oxides of iron and silica in the form of chert. Those of you who are metallurgists will understand that problem.

From the figures of production which I have quoted, you have probably reached the conclusion that all is well with the iron-ore industry. I hasten to correct that impression. The movement of iron ore is indeed satisfactory, but since 1923 there has been a net reduction in the price of iron ore amounting to \$1.30 per ton without any compensating reduction in the cost of labor, materials, supplies, and transportation. In other words, this \$1.30 reduction in price is borne by the iron-ore operator. Were it not that during the last three or four years the operator has found means of reducing his cost of production without cutting the wage of labor, although paying the same prices for materials, supplies, and transportation that he paid in 1923, he would not be able to produce ore at the rate of 60,000,000 tons per year. It has been said and I believe that last year 25 percent of the iron ore was brought down the lakes at a net loss to the operator, that 25 percent was brought down at no profit, and the remaining 50 percent at a small profit to the operator. Inasmuch as this year there has been no change in freight, wage, and material

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† Oglebay, Norton & Co., Cleveland, Ohio.



costs, it is expected that the same situation applies to the year 1926.

You will be interested, of course, in the reasons why we have such an unsatisfactory price for iron ore in view of this enormous movement. One cannot in a few minutes explain why it is that the price is about at the average cost of production. Perhaps few of us know all of the factors in that problem, but I will undertake to mention some which have a strong influence on this condition.

A very important cause of depressed values is an over-development of the mines. Notwithstanding that the ore reserve is small in relation to long future demand, a very large part of it has been made accessible by the sinking of shafts, opening of pits, and the installation of mining machinery and railroad trackage. The capacity of the mines to produce is today about 100,000,000 tons per year as against an apparent demand for not more than 60,000,000 tons per year. This over-development has been brought about through combined operation of several influences. One of them is the tax system and tax policy of Minnesota, Wisconsin, and Michigan. In all of these states the ore reserves are appraised for ad valorem taxation, the result being that each ton of known ore in the ground must pay an annual tax until it is recovered. Naturally the tendency of the operator is to get that ore out as soon as possible. Minnesota frankly places a much heavier burden of taxation on iron mines than on any other class of real property. It required an amendment of the Constitution to permit the legislature to do this. If I remember correctly, the amendment was voted by the people in about 1907, the legislature promptly availing itself of the opportunity thus presented to relieve rural and urban property at the expense of the iron mines to the end that in a given jurisdiction a dollar invested in iron ore bears double the tax borne by a dollar invested in a farm and half again as much as the tax borne by a dollar invested in urban property. But the discrimination was not permitted to end here. A couple of years ago a tax of 6 percent was levied on the income from iron mining under the name of an occupation tax. Thus the occupation of mining was itself made the object of discriminatory taxation. The average ad valorem tax on a ton of ore leaving Minnesota is about 50 cents. I have no figures to show how much additional tax is paid by each ton of ore through the operation of the so-called occupational tax. In Wisconsin and Michigan there is no discriminatory taxation of iron mines. The average tax paid by the ton of ore leaving these States is, I believe, considerably less

than half of that attaching to the ton of ore from Minnesota.

A second influence of great importance attaches to the leasing system. Only a small portion of the iron ore is owned by the operator. He operates under an instrument, known as a lease, which obligates him among other things to pay all of the taxes and a royalty, but most important of all in its effect on over-development, a minimum annual rental which in the case of a good many properties, especially in Minnesota, amounts to an enormous sum per year. These rentals must be paid, it matters not what the condition of the industry is. It is the purpose of most of these leases to encourage if not compel a rapid development and exhaustion of the ore.

Finally, we have to say that the voters in the local tax jurisdictions, again particularly on the Mesabi iron range in Minnesota, owning votes but not mines, have made the most of the opportunity afforded by large taxable values in iron ore of taking a large share of this natural wealth for public enterprises of all sorts in amounts far in advance of reasonable needs. Time does not permit a further discussion of this phase of the situation, but you may draw your conclusions of what it is when I say that a ton of iron ore worth from \$2.00 to \$3.00 at the mine pays taxes in the amount of 50 cents to 60 cents.

Perhaps you now see clearly why it is that the iron-ore operator endeavors to force as much of his ore as it is possible to do on the market and to develop his mines to such an extent that he may avail himself of every opportunity to ship. In the face of these conditions he finds his market considerably narrower than it used to be. Last year there was imported through Atlantic ports the equivalent of 3,000,000 tons of Lake Superior iron ore in the form of pig iron, scrap, and iron ore. There is a tendency for a further increase of imported iron, a further displacement of markets formerly enjoyed by Lake Superior iron ores.

All of these factors and others determine the value of Lake Superior iron ore. In 1926 the operator received at Lake Erie port \$4.25 for a ton of standard non-Bessemer ore shipped from the great Mesabi iron range of Minnesota. To get that ton of ore from his mine to upper lake dock he paid the railroad 91 cents. From upper lake dock to lower lake port he paid the ship 83 cents, making total freight charges \$1.74. He paid in taxes in 1926 probably about 50 cents. After paying freight and taxes he had \$2.01, but out of this he had to pay a royalty to his lessor. I do not have the figures on royalties, but on the Mesabi range they vary from a few cents to more than \$1.00 per ton. In this case

we will suppose the royalty to have been 60 cents, a moderate amount considering the rates in many modern leases. The operator now has left \$1.41 to defray the cost of mining and overhead and out of which to get his profit. We have, I am told, enough bituminous coal in this country to last us 6,000 years at the present rate of consumption. I have said that Lake Superior high-grade ores will be exhausted in little more than a generation. We have heard a good deal of the sad plight of the coal miner, but the fact seems to be that right now bituminous coal is worth more at the mine per ton than iron ore.

A situation of this kind induces in the course of time remedial changes. The readjustment is painful and all too often fraught with disaster to the weaker units in the industry. The iron-ore industry of the Lake Superior region is in no danger of extinction nor of contraction to a point where it could not supply all of the ore required by the country. It operates against a strong financial background formed of the great steel and iron manufacturing companies of this country. If I had not been required by the limits of this program to confine my remarks to the state of the iron-ore industry, which is the foundation merely of the iron and steel business of the country, the picture would have borne a considerably less dismal aspect. But I am not delegated to discuss the state of the iron and steel industry and in any event, would not be able to discuss it on any firm ground of study and contact with it, but I trust that my remarks, brief as they are, have given you some idea of the unsatisfactory condition of the foundation of the greatest industry of this country and the world.

#### Mine Drainage Studies

In a study of mine drainage in the red iron ore mines of the Birmingham district of Alabama, an extensive series of measurements was made by the Bureau of Mines in order to determine the drainage from the area overlying and adjacent to the mines. Gaging rods were generally used in measuring streams, and weirs in ditches and sometimes as a check on rod work. These tests in turn were checked by current meter tests. In all, 725 separate stream gagings and 97 weir measurements were made. Certain relationships were worked out, particularly between rod and weir tests, which permitted obtaining results that are much more accurate under the existing conditions, than any available formula would give.

Copies of Serial 2779, by W. R. Crane and E. J. Maust, may be obtained from the Bureau of Mines, Department of Commerce, Washington, D. C.

## PROMOTING AN EXPANDING FUTURE FOR COPPER\*

*Copper Is Consumed In Large Quantities In The Electrical, Automotive, And Radio Industries—Iceless Refrigeration A New Large Consumer—Building Industry Shows Greatest Increase In Use Of Copper Products—A Review Of Future Possible Development In The Industry*

By THOMAS D'ARCY BROPHY †

**J**UST as the United States is foremost among the nations of the world in copper production, likewise, the United States is the greatest copper consuming country in the world, due to its great and unparalleled development of manufacturing industries and its widespread prosperity.

The past five or six years have seen a very substantial increase in the consumption of copper throughout the country, which is due in part to the campaign of research, advertising and general trade development carried on by the Copper and Brass Research Association and its member companies, the principal copper producers and manufacturers. It will be interesting to consider, in a brief way, some of the more important consuming industries, to point out how their use of copper has increased, and what the future holds forth.

Electrical manufactures constitute the largest group consumer of copper, the reason for which is easily apparent in this age of electricity. The last five years have shown an unparalleled development of facilities and equipment for electric power and lighting, transportation and communication.

Each year has shown a steady increase in volume of construction of steam and hydro-electric plants, of transmission and distribution systems, the number of wired homes and telephone stations, as well as the sales of electric merchandise of every character.

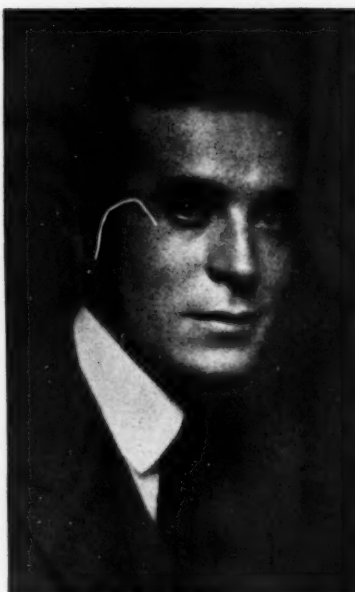
The whole electrical industry is dependent upon copper, and the growth of the former is shown by its consumption of the red metal. In 1921 electrical manufactures of all kinds consumed nearly 450,000,000 pounds of copper; in 1925 this figure had increased to 765,000,000 pounds.

Outside of the electrical industry, automotive manufactures represent one of the largest consumers of copper in its native form, as well as in brass, bronze and other alloys.

It may surprise many a car owner to learn how much copper his car may carry, since little of it appears exposed to view, outside of hardware, hub caps and trim. Poundages per car vary all the way from about 30 in the light and inexpensive types to 600 or 700 pounds for the heaviest and most expensive models.

Copper consumption in automobile manufacture is largely accounted for by such items as starting, lighting and ignition systems, radiator cores and shell, bushings and bearings, gas and oil piping, headlights, hub caps, hardware and metal trim.

Copper consumption in the automobile industry has increased very rapidly



Thomas D'Arcy Brophy

since 1921, when it was relatively low, owing to diminished production and the waning influence of war dictated metal substitution. Since that time better construction and design, with added refinements of mechanism and style have contributed largely to ever-mounting car sales and car registration. All this has been reflected in the amount of copper consumed by the automobile industry, as shown by the following figures, which include replacement and repair parts as well as new car construction:

	1921	1925
Car production.....	1,661,000	4,336,000
Car registration.....	10,464,000	19,954,000
Pounds copper consumed..	70,000,000	245,000,000

In 1924 the radio industry consumed between two and three million pounds of copper in the manufacture of receiving sets, both amateur and factory made. In the last two years this consumption

has shown a surprising increase, due not only to the greater number of sets sold but also to the growing elaboration and refinement of radio sets of all types of design. This is shown by the increase in number of circuits per set, and especially the use of brass as a material for panels. The consumption of copper in radio now is running between eight and ten million pounds per year. One of the newest refinements is "shielding"—inclosing each circuit of a set in a grounded sheet copper box—which may of itself in a year's time increase the figure given above to sixteen or twenty million pounds.

The manufacture of iceless electric refrigeration has reached an importance which makes it one of the largest of the newer consumers of copper. Extended development of the industry which produces equipment for this type of refrigeration has been very rapid during the past year through the linking up of co-operative effort between the manufacturers and the great electric power companies. It is estimated that the 1926 requirements of the industry will total 45,000,000 pounds of copper, largely in the form of tube and sheet.

Considering only the household market for electric refrigeration, the possibilities for this lusty industry are enormous. In the last five years unit sales have doubled each year and still less than 5 percent of the market has been sold. With nearly 20,000,000 ordinary refrigerators now in use, and over 12,000,000 homes already wired for electricity, the number of electric refrigerators in household service alone should soon reach the washing machine total, which is figured at nearly 4,000,000.

European countries have always been large consumers of copper for locomotive fireboxes and boiler tubes, instead of steel, as is the practice on railroads in the United States and Canada. Copper fireboxes and copper or brass boiler tubes are standard on the railroads of England, France, Germany, Belgium and Russia, and in many of their colonies and dominions.

In order to bring to the attention of American railroad officials the advantages which European railroads have found in copper-equipped locomotives—such as improved heat transfer and lowered maintenance, especially in bad water districts—The Copper and Brass Research Association is now cooperating with a well-known western railroad on

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† Vice president Anaconda Copper Mining Company; member Advisory Board of Copper and Brass Research Association.

complete service tests of a powerful locomotive, which is equipped with a copper firebox and copper boiler tubes. The number of locomotives on the railroads of the United States totals over 70,000, and the amount of copper sheet and tube which might be applied to any one locomotive would vary from 10,000 to 30,000 pounds.

Perhaps of all the markets that have shown a substantial increase in the use of copper and brass none can compare with the building industry. Prior to 1921, the consumption of brass pipe for plumbing was negligible, and the use of brass or copper pipe for underground water connections was practically unknown. The same was true of copper downspouts, eaves trough and roof flashings, as well as copper and bronze window screens and bronze weather stripping. In 1922, with a total building volume of \$4,920,000,000, the building industry consumed 164,000,000 pounds of copper. In 1926, with an estimated building volume of \$5,500,000,000, copper consumption will increase to at least 275,000,000, a growth in five years of 111,000,000 pounds, or 68 percent.

Today we find that for every \$20 spent for building construction, 1 pound of copper is used. In 1923, 1 pound was used for every \$26 spent—in 1922, 1 pound was used for every \$30 spent.

As an example of the tremendous possibility for still further increase of copper, brass and bronze in the building industry, analysis of the potential market for brass water pipe will be interesting. There are not less than 12,000,000 residences available for brass pipe installations in the United States, and each residence can use from 200 to 1,000 pounds of brass pipe, with 400 pounds a fair average. With an allowance for obsolescence of residences before present plumbing needs replacement, it is estimated that the potential market for brass pipe in existing residences is over 2,000,000,000 pounds, and that the annual potential market in new-house construction is over 100,000,000 pounds. A fair estimate of the amount of copper required for equipping the average house with eaves trough, downspouts and roof flashings is 200 pounds, which makes the potential market, roughly, half the market for brass pipe.

The recent development of several types of copper shingles has materially increased the consumption of copper in the small house field. The average house roofed with copper shingles and fitted with copper gutters, leaders and roof flashings consumes about 600 pounds of copper. It is estimated that the potential market for copper roofing is 2,400,000 squares per year—consuming 48,000,000 pounds of copper.

As an example of the revitalizing of a

waning market for copper I may cite the lightning rod business.

For many years, unscrupulous persons robbed the farmers by means of fake lightning rod installations and as a result lightning rods had been looked upon with distrust and disfavor. For 10 years prior to 1921, it was practically impossible to induce the farmer to install a system of lightning protection. In the meantime, lightning had been taking a tremendous toll, not only of property but of life. During the past five years, intensive effort has been made to demonstrate the efficacy of copper lightning rods and the farmer has, to some extent, forgotten his previous unfortunate experiences and has come to realize the wonderful efficiency and economy of this protection. This is an outlet for copper that might consume 200,000,000 pounds. At the present time the consumption is estimated to be about 15,000,000 pounds.

Another important market for copper is represented by the lighting fixture industry, which is closely allied with the great field of electrical manufactures. The tremendous increase in the number of residences wired for electricity during the last 10 years has resulted in a total of nearly 14,000,000 wired homes. At the same time there has been a great improvement in the general design and attractiveness of lighting fixtures which have drawn on the artistry of all periods and types. This has resulted in an increasing use of brass as a construction and decorative material for fixture manufacture, as combining structural strength with fineness of line and the ability to take and hold a wide variety of beautiful finishes.

For outdoor fixtures, such as porch and garage lanterns, and traffic signals, sheet copper is being largely used. The architectural type of lighting fixture, for halls, schools, public buildings, museums, hotels, memorials and expensive residences, is usually developed in most decorative of all fine construction materials—bronze—an alloy largely composed of copper.

The lighting fixture industry, as a whole, uses over 40,000,000 pounds of copper per year in all forms.

Another market which today is consuming very little copper or brass but which offers immense tonnage possibilities is the use of copper for household radiators. This market has been agitated for a number of years but certain trade resistance will have to be overcome and mechanical details worked out before this market will consume the immense tonnages of copper which should go into it. It is certain that with a copper radiator using one-tenth the space and weighing one-fifteenth as much as the present ungainly radiators, it is but a question of time before their use will

become general, especially as they may be installed entirely out of sight.

According to present-day standards of wiring, and present-day desires for the most convenient use of electric light and power in the home, it may be safely said that all residences built and wired more than five years ago are inadequately wired. The proof of this statement is seen in the widespread use of two and three-way plugs and long extension cords, and the frequent over-loading of branch circuits, with resultant blinking of lights and blowing of fuses. To add only two more branch circuits with 10 outlets each, to the number of wired residences as of 1921 (7,714,118) would turn up a new market for copper wire totaling 40,000,000 pounds and a complete rewiring campaign would require well over 100,000,000 pounds of copper.

In closing this summary of the growth of the markets for copper, it is particularly interesting to note that the general increase in the domestic consumption of copper has resulted from the development of new industry as well as from extensions in the older and longer established industries. Stated briefly it may be said that the domestic use of copper has increased in five years from a per capita consumption of about 7 pounds in 1921 to almost 15 pounds per year for every man, woman and child of our population. This result has not been achieved without great and continued effort. Not only has the buying public been conscious of the advantages of using copper, brass and bronze through advertising and publicity, but the closest cooperation has been maintained with manufacturers in hundreds of lines to insure the most effective use of our metals. Commercial research of a most thorough and comprehensive character has been and is being assiduously carried on, to the end that the great potentialities for copper utilization may eventually be realized.

If the spirit which has animated this effort of the copper industry to develop the domestic market may be expressed in few words the homely phrase "God helps those who help themselves" comes close to the mark. What has been accomplished is the result of diligent and sustained effort.

If I may be permitted to depart for a moment from the main theme of this paper I should like to say that what has been done with copper can be done to a considerable extent with other metals. At this time the great silver mining industry is faced with the problem of lessened demand and I am happy to state that an effort to increase the domestic use of silver, modeled in some respects upon the copper campaign is well under way. The annual per capita purchase of sterling silverware in the United States today is the (Continued on page 64)



## THE PRESENT STATE OF THE GOLD INDUSTRY\*

*Consistent Effort To Meet Increased Costs With More Efficient Operation Has Met With Success—The Portland Gold Mining Company. And What Has Been Done To Put Its Properties Again In The Producing Class*

By J. W. ADY, JR.†

I REGRET that Mr. Callbreath's request reached me in New York where I had little data available relating to the general conditions of the gold mining industry. It will therefore be necessary for me to confine myself to the situation in Colorado with which I am familiar.

I am glad to say that the production of gold in that State, due to an increased interest in mining generally, has slightly increased. There is considerable new activity in some of the old camps and new discoveries have tended to further stimulate interest and consequently increase production.

Generally labor conditions have improved and we have less difficulty than in the past in getting experienced men. I feel that along this line, it is the duty of every operator to pick out and train machinists and skippers for hoist men and to develop as many trammers and muckers into machine men, as possible. This policy has a stimulating effect on the young men who might otherwise turn to a different line of work. At the same time, it makes the operator more independent and, in my opinion, is much less costly in the long run than to be at the high expense due to excessive labor turnover from which many operations are now suffering.

Generally speaking, I believe that the number of real leasors is seriously on the decline. I can only attribute this to the gradual dying out of the old "prospector" breed, of whom the leasor is a natural descendent, and I am afraid we shall have to depend less and less on this source of production. The most effective means under present conditions of stimulating interest in leasing will be to decrease still more materially the royalty rates now in vogue in many camps. Where possible even a slight decrease in treatment charges, especially on low grade ores, will greatly stimulate the leasing operations, as has been evidenced in Colorado during the past year.

To those of you who are interested in the fight for the existence of the gold mines, it may be helpful as an outstanding example, to know of some of the changes in the plan of operation which have brought the Portland Mine in Victor, Colorado, back into a condition where it is making consistent earnings, has a substantial treasury, and is again on a

dividend-paying basis. And this, after a period of several years of increasing losses which resulted in its being, about four years ago, several hundreds of thousands of dollars in debt and running behind from twenty-five to forty thousands of dollars each month.

The re-establishment of the Portland on a profitable basis was not because of greatly-increased production—either in tonnage or value—but because of consistent efforts to meet increased costs with more efficient operation. I think the most outstanding element in this plan has been the substitution of contract work for day labor in every instance possible. Where ever possible drifting, cross-cutting, stoping and tramming at the Portland is on a contract basis. In addition to this, bonuses are paid to skippers and hoist men. As is the case with most gold mines, where a constricted mineralized area makes room enough for only a limited number of men to work, each man has to be stimulated to the highest pitch to get desirable results. This can not be done when men are working on day's pay. Sixty-dollar ore, mined slowly enough will run into a loss, but there is plenty of money to be made on \$6.00-ore mined properly. Production at the Portland had never fallen off materially over an extended period. It was just a question of making the normal production at a smaller cost. Outside of the radical change in the labor conditions, the next step, made under the most adverse financial conditions, was the replacing of the steam plant with electrical equipment. Further, every tool and every piece of equipment on the mine and mill is kept at the highest point of efficiency possible. Sunday work, except for the repair gangs, has been abandoned, and this without any decrease in production and with a resulting better morale generally among the men. A careful geological study now precedes every piece of development work of any nature and as a result, the cost of developing new ore has been decreased materially.

As a result of these policies, the Portland, although operating on a smaller tonnage than heretofore, mining at a depth of 3,000 feet and pumping 1,000 gallons of water a minute, has been brought to a point where it is making net earnings of from thirty to eighty thousand dollars per month on ore which

will average, over yearly periods, of from only six to eight dollars per ton.

Happy as has been the solution of the Portland problem, there are certain elements in that case, which are not applicable to that host of gold mines which have failed to "come back" and which can not do so without some extra stimulus. And because we have not yet found a way to give that stimulus, the old condition still obtains, and in a form more aggravated each year. For the production of gold still lags farther behind each year the commercial use of it.

I feel that we are all firmly convinced that there is no hope of direct governmental assistance—either in subsidizing the industry or by special tax reduction. But I am not yet convinced that we can not get indirect help from the Government, for I do not feel that it is the disposition of this Government to let any industry as vital as gold mining die, if there is any logical and impartial course that can be pursued which will be of help to it.

That such action can be hoped for, is evident from the attitude of the Government in connection with the copper-mining situation. The copper market was made by interests foreign to the producers and in our case, the present market on fabricated gold is certainly not with the producer, but directly in the hands of the Government. The United States Mints and assay offices today are but adjuncts to the manufacturing plants of dental supply houses and jewelers. The United States Mints and assay offices have always been the market place for almost any gold that was offered and much of it came to them without too good a proof of title. I am glad to say that the present Director of the Mint, Mr. R. J. Grant, has taken a lively interest in ascertaining the source of the gold offered for sale, and has done more to discourage the "high grade" than has been possible through any other agency.

When I say that the Government Assay office and Mints are adjuncts of the gold fabricator, I mean this: That any one wanting to buy gold bars or to have junk gold melted and alloyed, or assayed, can have this service from the mints at a cost which would not be possible if the operation were self-supporting. In other words, the taxpayers of the country, pay part of the fabricating cost of practically all the gold used in the arts in this country. This situation is not desirable to any interest but to the gold fabricators. Certainly (Continued on page 54)

\* Paper presented to 29th Annual Convention, The American Mining Congress, Washington, D. C., December 7-10, 1926.

† Managing Director, Portland Gold Mining Co., Colorado Springs, Colo.

## THE SILVER SITUATION\*

*Crux Of Silver Situation Is What Can Be Done With An Annual Production Of 245,000,000 Ounces If Consumer Of 45 Percent Of It Not Only Withdraws from Market But Becomes Seller Also—Problem Is One For Combined Thought of Statisticians, Financiers and Economists*

THERE is very little, if anything new to be said concerning the situation in the silver markets. The price has declined rapidly in the past few weeks, and as a consequence there is more or less consternation among producers everywhere. The crux of the situation appears to be, what can be done with an annual production of 245,000,000 ounces of silver if the consumer of 45 percent of this amount not only withdraws from the market, but threatens to become a seller upon a large scale?

This is a problem for the combined thought of statisticians, financiers and economists. I do not feel competent to qualify for any of these, hence, I shall confine my remarks to a few of the fundamentals which I believe will have an influence upon the future of the industry.

Since the discovery of America, more than 13,000,000,000 ounces of silver have been produced. A small part of this amount has been absorbed by the industrial arts. A somewhat larger amount is probably now used as money and tokens, leaving the greater amount as stocks or hoards chiefly in Oriental countries.

The underlying influence in the market for silver has been the psychology of mankind. Man has been trained through ages of custom to trust his savings in such an investment, if such it may be considered. To change this sentiment and a custom which has prevailed since the beginning of civilization in a short time, even a decade or during a single generation, does not seem possible.

It can not be said that the world today possesses a surplus of this metal although governments may be in possession of large quantities of silver not needed as reserves or for monetary uses. Our experience during the World War, when the price of silver bullion advanced to a point much higher than its coinage value clearly answers to my mind any argument that may be advanced to the contrary. These facts I believe justify us in taking a more optimistic view of the situation.

If it should develop, however, under the new conditions created by the action of the Royal Commission in recommending a single gold standard for India that new production should become a burden to the market, the logical outcome would be a curtailment of production. This

By FRED CARROLL†

would be brought about, first, by the closing of those mines which produce silver only. The next to follow would be those mines whose profits are a fraction of the income from silver.

Between 25 and 30 percent of the silver produced in the United States is



Fred Carroll

made by distinctive silver mines. A lesser amount comes from copper mines as a by-product, and the remainder, about 50 percent, comes from the lead and lead zinc mines of the Rocky Mountains as an associated metal. The same conditions do not obtain to a similar extent in other parts of the world. The mines of Mexico are more distinctly silver mines, and in Canada a much smaller percentage of the silver produced there comes from mines where this metal is associated with common metals. I have not any definite statistics on the matter, but it appears safe to estimate that approximately 120,000,000 ounces or 50 percent of the world's annual production, comes from mines which yield silver only, and that this metal alone must bear the full burden of cost.

Few of such mines could produce if the price for the metal should fall below 40 cents per ounce, and in that event the

world's production would probably decline to 125,000,000 ounces. Should this happen, Mexico, being the largest producer, would suffer by far the greatest losses.

It is my opinion, however, that there are many indications that the price of silver will not decline to a point where widespread suspension will become necessary. The reaction in price from the low made a few weeks ago and the more optimistic expressions coming from financiers, as well as the fundamental sentiment before described, leads me to believe that we have seen the low price for the present movement and that prospects for extended uses for silver, both in the industrial arts and for monetary purposes, are to be expected.

### DEVELOPMENT OF THE DIAMOND DRILL

THE diamond drill, which was invented about 1863 by Robert Leachot, a French engineer employed on the Mont Cenis Tunnel, is the oldest form of the core drill, states the Bureau of Mines, Department of Commerce, in a recently issued bulletin. In his youth Leachot had been a watchmaker and had thus become familiar with the wearing qualities of the jewels in watches. Observing that the steel in the bits used to bore holes for blasting wore out quickly in the hard rock, he conceived the idea of setting diamonds in the bits to make them wear longer, probably using white diamonds instead of the black stones.

The diamond drill was first used in the United States during the late sixties at the Vermont marble quarries, before the steel saw had been invented for cutting out blocks of marble.

M. C. Bullock saw the advantage of this drill for prospecting and bought the American rights to the Leachot patent. The earliest exploration work with the diamond drill was probably in the Pennsylvania coal fields, where, in 1872, a hole 700 feet deep was sunk by the diamond drill. It is interesting to contrast this hole with 7,347-foot hole drilled with a diamond drill by the Imperial German Government near Czu-chow, Upper Silesia, Germany, in 1909.

The diamond drill is now being used in connection with oil field prospecting and development, and a report relating to this subject has been issued by the Bureau of Mines. Copies of this report, Bulletin 243, may be obtained from the Bureau of Mines, Washington, D. C.

\* Paper presented to Twenty-ninth Annual Convention, The American Mining Congress, Washington, D. C., December 7, 1926.

† Mining engineer, Denver, Colo.

# PRESENT STATE AND PROBLEMS OF ZINC MINING INDUSTRY\*

*Possibilities Of Increasing Consumption Are Good Both Through Advertising And Popularizing The Use Of Zinc And Through Revival Of European Prosperity—Future Of Industry Seems Eminently Satisfactory*

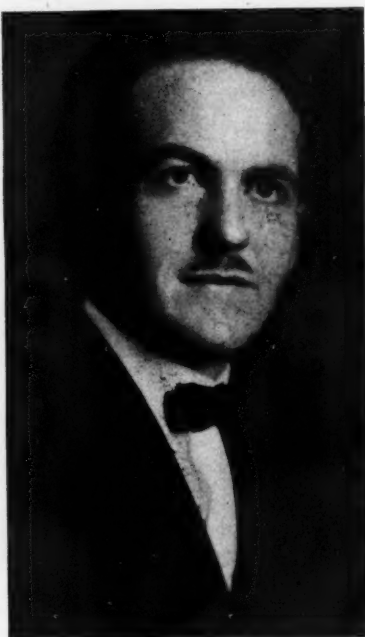
By J. D. CONOVER†

**I**N any review of the zinc situation it should be borne in mind that in zinc probably more than in any other major metal there is a sharp division between the mining and smelting of the ore. This division is not simply geographical, involving mining in certain localities and smelting at other points, where an adequate fuel supply is available, but involves also, particularly as concerns the largest zinc mining district in the world, an ownership of mines largely distinct from the ownership of smelters. There results a natural conflict of interest. The miner, who wishes to sell his product at the best price obtainable, finds himself naturally opposed to the smelterman, who wishes to buy it as cheaply as he can and thus to obtain a maximum spread between the cost of his ore and the amount received for the metal made from it.

In Europe zinc ores are all bought on contract, the price being based on the smelter quotations of the London Metal Exchange. In this country, however, there is no recognized exchange functioning after the manner of that in London, and lack of confidence on the part of ore producers, caused by incomplete knowledge of smelters' operations and sales of metal, has thus far prevented attempts to establish any definite scheme or rule for buying ore.

These last remarks apply mainly to the Tri-State District of Oklahoma, Kansas and Missouri, which has for the last six years produced about two-thirds of the total zinc mined in the United States and about one-third of the world's total. This district, long known as the Joplin or Southwest Missouri region, though now producing 90 percent of its output from the great mines in Oklahoma and Kansas developed during the World War, is probably less well known among the mining fraternity, in proportion to its size and importance, than any other mining district in the world. The tonnage mined, averaging at the present time over 50,000 tons per day, to the best of our knowledge places it practically at the top among non-ferrous metal mining districts, and ranking second only to the gold fields of the Rand. Most mining men have little or no conception of the magnitude of its operations nor of the efficiency and low cost obtained both in mining and milling. The zinc concentrates which it produces, a

third of the world's total, are far and away the best third, from the standpoint of quality, are freer from impurities and more easily handled and smelted, than the great bulk of the balance of the world's output. The ten thousand men employed in the mines are practically 100 percent white, native-born Americans, whose wages go up and down with the price of ore and amongst whom



J. D. Conover

unions and labor troubles are unknown. The district has practices which are distinctly its own and which appear strange to engineers from other districts, but which have been developed by an experience extending over 70 years and are well adapted to the type of deposits and the short and sometimes uncertain life of individual mines. Improvements can, of course, be made, particularly where large units are involved, and the last few years have seen many new developments in mining and milling; chief among these may be mentioned the general introduction of flotation, to recover values in the slimes and chats which were previously lost.

Another development of recent years has been the more intensive study by miners of the Tri-State District of the economic conditions surrounding their

industry. There are in this field over 200 mills capable of producing zinc concentrates, 165 of which are at present in operation. The capacity to produce is far above the actual needs of the market, which for the last year or so have been between 15,000 and 16,000 tons of 60 percent zinc concentrates per week. Production in excess of this actual demand tends to create a surplus which weakens the market, and may force prices below the average cost of producing ores. In the past history of the Tri-State District this has occurred time after time, and each enlargement of production and accumulation of surplus has been followed by the inevitable depression and disaster, not only to the mine owners, but to the workmen and to the whole community affected by the industry. The problem is precisely the same as that which affects the coal miners and the producers of oil, copper, and other minerals, and which is at present so acutely evident in the case of the cotton growers of the South. The consequences of over-production are not only depression and hard times for a great industry and large number of American workmen, but wasteful exploitation of the best grade of zinc ores in the world. In this case also, it happens that a large number of Indian wards of the United States Government, upon whose lands mining is being carried on, with payments of royalties to the Indians based upon prices received, are deprived of a large part of their possible income through depletion of their deposits at low prices.

Under the present laws of the country there is no remedy for this situation except through the supplying of statistics and facts to the mine operators to assist them in studying their situation. So far as possible this is being done, and very beneficial effects are to be observed. Intelligent application of such studies by individual operators over the past few years has done much to eliminate excess production and to stabilize the price for their product. The price of ore has come to be recognized as a definite part of smelter costs, rather than as something which could be juggled at will to correspond with a possibly manipulated metal market, and in such manner as to maintain the smelters' profit regardless of consequences to the miners. Action by individuals, however, falls far short of being really effective, and today Tri-State zinc ores are selling barely above the average cost of production. Freedom to cooperate or combine, in a

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† Secretary, Tri-State Lead and Zinc Ore Producers' Association.



manner not now granted by the anti-trust statutes, is needed if our best zinc ores are to be mined and marketed with due regard to conservation and the interests of the Government's wards.

The practice of buying and selling zinc concentrates in the Tri-State District is also unique but also leaves much to be desired. Ores are sold each week to the local representatives of the various zinc smelters, who buy them f.o.b. mine bins and arrange all details of loading, sampling and shipping to the smelters, about half of which are located in the gas fields of Oklahoma, Kansas and Arkansas, and the remainder in the coal fields of Illinois, Pennsylvania and West Virginia. Buyers are comparatively few in number as compared to the producers, and the advantage in bargaining is largely on their side. It is rarely possible to obtain a higher price from any one buyer than another, and the producers feel strongly that any legal disposition which would allow them to organize in such manner as to arrive at a similar uniformity of thought as to what the price should be, would greatly benefit the industry.

Recognition of the conflicting views and interests of zinc ore producers and zinc smelters has been intensified in recent years and this has helped to clarify the situation. There is much to be gained by plain speaking, by frank recognition of differences and by open publication of the facts concerning the industry. In particular would it be of benefit to have full information concerning all parts of the industry, including regular and frequent reports of production and stocks of ore and metal, average production costs, and quantities of metal sold at various prices, published for the information of all concerned. The mining end of the industry, at least in the Tri-State District, is doing its full part toward this end, and it is hoped that negotiations presently being carried on will bring about the adoption of the same principle of action by the smelting branch.

The last few years have witnessed an increased amount of activity on the part of zinc smelting companies to obtain mines in the Tri-State District. No less than 10 companies affiliated in one way or another with zinc smelters are now operating mines in the district, and a great amount of prospect drilling has been done in the endeavor to extend their producing acreage. Today, however, the production of these companies is barely a third of the total of the district, a smaller proportion than obtained a few years ago. The actual known reserves of the district, particularly of higher grade ore, are limited, and the proportion of these owned by smelting companies is very much less than one-third. On the other hand certain of the larger mining companies are

from time to time reported to be contemplating entry into the smelting business, but thus far no definite action of this sort has been taken.

The average recovery of concentrates in the Tri-State District has been rather steadily decreasing for a number of years, from about 9 percent of the total tonnage mined to about 6 percent or a little less at the present time. The district is mining leaner and leaner dirt, and this is shown by a decrease in the average percentage of concentration the last two years in spite of the fact that during this time 120 flotation units have been installed to recover values previously lost. A considerable number of mines which had been operating actively since the early days of the Picher field have been cut out; some of these mills are now re-running the tailings, but with the production of concentrates naturally very much reduced. The progress of exploration and development, together with new mill construction, however, have to date balanced or somewhat more than balanced the thinning down and exhaustion of such mines, and the capacity for over-production previously referred to is still abundantly evident. The predictions of only a short life for the Picher district, made a few years ago, have not been verified. The finding of additional deposits by closer drilling in the main part of the field, extensions of the field in various directions, and better extraction of values have extended the reserves far beyond previous estimates, and there is no doubt of the capacity of the field to produce on a large scale for many years to come. It is becoming increasingly evident, however, that the reserves of higher grade ore are distinctly limited, and that an increasing proportion of the tonnage mined will be of lower grade and will necessitate correspondingly higher prices to make its exploitation profitable.

Turning to sources of zinc outside of the Tri-State District, we find in the central and eastern United States that there have been no important changes for a number of years. The Platteville district of Wisconsin, with a considerable number of small mines of a type similar to the Tri-State District, has been increasing its production gradually, in view of better prices the last two years, but produces less than 5 percent of the country's total. Sources of production in Tennessee and New Jersey have been approximately stationary, while development indicates some increase to be expected from northern New York and from Virginia. There has also been a small amount of zinc production developed in the Southeast Missouri lead district, some of the concentrates containing an extraordinary quantity of silver. The total production from all this eastern group of states is not likely to increase by more than ten

to fifteen thousand tons of recoverable metal, or perhaps 10 percent, over last year's production.

Throughout the western United States and in fact throughout the length of the American cordillera, extending from British Columbia down through Mexico and continuing in South America, there are great quantities of zinc ores, mostly associated with lead and silver and in a number of districts with copper. These ores are of varying degrees of complexity and difficulty of separation into commercial products. For many years zinc was the bugaboo of the western miner, being penalized by smelters when present in excess of 6 to 10 percent, and zincky ores were avoided as far as possible in mining. In many cases every effort was made in the mills to discard the zinc, either storing it in tailings or allowing it to go down the creeks. During the World War, high prices brought about the marketing of considerable quantities of Western zinc ores, mostly in the form of carbonates or of concentrates produced from the less complex and more easily separated sulphides. The application of flotation to the ores of Butte, Mont., and the development of the electrolytic process for production of high grade spelter stimulated these developments. Production reached as high a figure as 300,000 tons of recoverable metal per year, equivalent to 40 percent of the United States production. Following the War, however, there was a radical decline in Western zinc production, and it has not been until the last two or three years that it has again begun to increase. Recent developments have been due principally to great strides made in the art of selective flotation, by which many of the mixed and complex lead-copper-zinc-iron ores, which formerly could not be treated at all, or only treated under heavy penalties for zinc content, are now separated into two or more commercial products. It is now common to find a differential flotation plant producing first, a lead or lead-copper concentrate containing the bulk of the gold and silver values of the ore and relatively little zinc; second, a zinc concentrate containing most of the zinc and only a small quantity of the other metals; and in some cases a third product consisting of an iron sulphide concentrate, valuable as a flux or for sulphuric acid manufacture and also containing most of the remaining gold and silver.

High prices for lead the last few years and the apparent scarcity of supplies have stimulated these developments, since many lead mines have encountered increasing quantities of zinc at depth, and some method of treating these mixed ores has been necessary in order to maintain production. The adoption of selective flotation throughout the Western States in the last few years has been so general that this subject hardly needs

further comment. Approximately 40 mills in these states are now treating mixed ores containing zinc by this process, as well as a certain amount of zincy tailings, and the production of zinc concentrates has correspondingly increased. One of the interesting features of this development has been the building of a number of custom mills, to handle the output of a large number of small mines and to secure tonnage for the lead smelting companies which have built them; this has been done in the Salt Lake Valley, in the Coeur d'Alene region of Idaho, in the San Juan district and at Leadville, Colo., and additional plants of this type are proposed for treatment of ores in southern Arizona and New Mexico. With the building of additional plants and extensions to existing mills, now contemplated, the zinc production of the West bids fair to increase this year by 40 to 50 percent over its 1925 figure of 155,000 tons, and within a few years to equal its War-time record. Recent low prices for silver affect this production to some extent, but in most lead-silver-zinc mines it seems to be more properly said that the newly developed zinc production is making it possible to continue profitable operations in spite of the low silver price, and no considerable reduction in tonnage is anticipated at present price-levels.

The zinc ores produced in the West, where not smelted directly by the companies producing them, are sold on contracts based on East St. Louis or London quotations for spelter. Between twenty and twenty-five thousand tons of concentrates per month are required by the electrolytic plant of the Anaconda Copper Mining Company at Great Falls, Mont., now reported producing at the rate of 10,000 tons of metal per month. These ores are drawn mainly from Montana, Idaho, Utah, Nevada and Colorado. Ten to twelve thousand tons of similar concentrates, mainly from Colorado and Utah, go monthly to retort zinc smelters in Texas, Oklahoma and Illinois. A smaller tonnage goes to zinc pigment plants, and the balance of the western zinc production is exported to European zinc smelters through Gulf and Pacific Coast ports. One of the principal lines of export movement, from the Coeur d'Alene district of Idaho, will no doubt be largely discontinued when a new electrolytic plant, now under construction at Kellogg, is completed. At least one additional electrolytic plant for treatment of western zinc ores is reported to be under contemplation.

Considering now the countries adjoining the United States, and the effect of their zinc production upon our market, we find both in Canada and in Mexico a distinct menace. The more we go into the situation the more plainly evident is it that a tariff, equal to at least the present schedule, must be maintained on

both zinc ore and metal if our domestic zinc industry is to continue to flourish.

In Canada the production of British Columbia, largely from the complex ores of the immense Sullivan mine but also from smaller lead-zinc properties, is increasing by leaps and bounds. The production of 30,000 tons of zinc metal three years ago will shortly be increased to 100,000 tons. Additions to milling capacity and to the electrolytic plant at Trail seem to be hardly completed and functioning before new extensions are announced. The Sullivan mine alone is reported to have 50 years' reserves of ore above the main tunnel level, with indefinitely great quantities below, and of a grade which makes possible large-scale production and quantity competition at almost any conceivable price-levels. The Flin Flon and other properties in northern Manitoba contain millions of tons of massive copper-zinc sulphide ore on which intensive metallurgical tests have been carried out, and which it is proposed to bring into production on a large scale. Zinc is found in some of the ores of the new Rouyn copper-gold camp in Quebec, as well as at other points in eastern Canada, and considerable talk is heard of a large electrolytic plant on the Saguenay River, where metal can be produced with the cheapest power in the world.

In Mexico a similar situation is found. From a production of about 20,000 tons of recoverable zinc metal in 1923 and 1924, output increased to over 50,000 tons last year and will probably double or more than double again this year. Here again increased production is coming largely through the application of selective flotation to lead-silver-zinc ores. The general grade of the ores being worked is considerably higher than in most of the United States deposits, and labor costs are far lower—50 cents to a dollar and a half a day being the usual range. For a large part of this production the lead and silver recovered will pay all costs, and the zinc is a by-product which can be sold for whatever it will bring. Development of additional tonnages of ore and increasing of mill facilities is going forward rapidly, and if all developments contemplated should be carried through it would not be unreasonable to expect Mexico to produce between four and five hundred thousand tons of concentrates, or perhaps 200,000 tons of recoverable metal, within a few years' time. Such increase would naturally take place with diminishing rapidity, and would be retarded by unsettled metal markets or political conditions, but the figures indicate the very serious bearing of the Mexican situation on our own zinc industry. At present only a couple of thousand tons a month of these ores are entering the United States, for smelting in bond, a small tonnage is being treated at a smelter in

Mexico, and the great bulk of the product is being shipped to European smelters. Various additional plans for making of metal from these ores have been rumored, including electrolytic smelting within Mexico and shipment to a tidewater plant, with very cheap electric power, in Canada.

At the present time it is only our tariff which keeps Mexican and Canadian zinc from coming into the United States market. Without tariff protection both zinc ores and zinc metal, produced at a cost far below that in the United States, could enter our country to the disaster of our own zinc industry. The need for continuing tariff protection for our labor and our industry can not be too strongly emphasized.

Surveying very briefly the zinc-producing situation in countries outside of North America, the principal change in the last few years has been the dropping off in production of zinc concentrates from Broken Hill, Australia, as the last of the enormous tailing dumps have been worked over. With production running at two hundred to two hundred fifty thousand tons of concentrates per year, only half the former figure, and with these treated entirely within the British Empire, the long established zinc-smelting industry of continental Europe two years ago found itself short of ore. There followed strenuous efforts to find new sources of supply and to increase production from established sources. Production in North Africa, Indo-China, Burma, Italy, and Silesia, as well as in North America, was increased, but that in Spain and China fell off. New sources of supply were developed in Peru and Bolivia, the former from mixed lead-zinc ores treated by flotation, the latter principally from an old dump of oxidized ore treated for silver by the Spaniards, which is now exhausted.

Agents of European smelters were very active throughout North America, and contracted for considerable supplies of ore in British Columbia, in Idaho, California and other western states of this country, and in Mexico. Much of this movement is still going on and will continue. They also came into the Tri-State District and some 40,000 tons of zinc concentrates were shipped to Europe from this district in 1925, with additional quantities in early 1926. Unfortunately, methods of selling Tri-State ores were not understood nor readily followed by European buyers, and foreign buying methods were not at all accepted by Tri-State producers. Most of the business was done through brokers, and though Europe was hungry for ores and actually paid high prices for them, the difference between these prices and the Joplin market, frequently amounting to several dollars per ton after deducting freight (Continued on page 84)

## NON-METALLIC INDUSTRIES IN 1926\*

*Freight Rates Which Must Be Lowered And A Protective Tariff That Must Be Sustained Are Among The Major Problems Of The Non-Metallic Industries—This Paper Deals With These Industries In The South, Their Development, Problems And Possibilities*

By HAROLD T. EDGAR †

ACCEPTING the invitation of your Board of Directors to represent the non-metallic industries of the South at the opening session of your 29th Annual Convention Tuesday morning, December 7, and your further desire that we have something to say about the needs of the non-metallics for lower freight rates and protective tariff, I would advise that I am only familiar with that portion of the industry having to do with the clay business of Virginia, North Carolina, South Carolina, Georgia and Florida, serving the paper mills, paint trade, potteries, floor and wall tile, electric porcelain, etc.

To put our problem as concretely as possible before you, it may be advisable in the first place to state that the clay business of North Carolina and Florida has taken years to establish, either having something of a freight advantage as in North Carolina, together with very limited production, and a clay of a very high character, or else, as in Florida, the quality of the product is somewhat unique and in a general way may be said to supplement uses of other clays, largely imported.

A small amount of clay, suitable for the paper trade, and to a lesser degree to the rubber trade, is mined in Virginia. This state enjoys a freight advantage over South Carolina and Georgia on business destined to the West. However, the production is somewhat limited, so that there are no great problems involved in that state. Consequently, any remarks I may have to make at this time will be directed to the South Carolina and Georgia clay fields.

From these two states more clay is shipped than from North Carolina, Florida and Virginia combined. The prices are highly competitive, and although business is largely done on an annual contract basis, there is the constant danger that any reduction in the import tariff or a decrease in the freight rates on the English clay—which is practically our sole competition—or an increase in the freight rates on the domestic product—will affect the industry disastrously.

At this point it might be well briefly to review some of the vicissitudes of the industries of these two states, starting back with the accession to power of the

Wilson administration in 1913. Just before the Underwood-Simmons tariff was put into effect, American clays were enjoying a protection of \$2.50 per ton on the English product, and equitable freight rates were in effect at that time. The new import tariff was reduced 50 percent to \$1.25 a ton. When this new



Harold T. Edgar

tariff went into effect all of the North Atlantic ports and interior New England business we enjoyed was lost to the American miner, due to low tariff and high freight rates from southern fields.

To make a personal allusion, when this disaster occurred, Edgar Bros. Co., at McIntyre, Ga., were marketing practically one-third of their tonnage in the New England field. To give you a concrete example, English clay delivered to Portland, Me., costs \$12.15 per ton, and the American clay costs \$8 at the mine, plus a freight rate of \$7.92, or a total of \$15.92 delivered. The war acted for us, as with everyone else, as an artificial tariff barrier, and any domestic clay would do. During this period, up through 1920, mills both in the East and in the West had to adjust themselves to the use of American clay. It might be stated right here that the domestic prod-

uct goes into suspension somewhat less easily than the English clay, and in fact, practically all the differences in character are of a physical nature. However, with some comparatively simple changes, the paper mills were able to adjust themselves to the use of the American product.

It follows, therefore, that some strong organizations were built up in South Carolina and Georgia during this period, with very considerable plant investments involved.

On the accession to power of the Harding administration in 1921, the Fordney-McCumber tariff of that period was promptly put into effect, and the duty of \$2.50 once more restored. This would have been moderately helpful to the domestic producer even with his greatly increased costs in the way of wages, fuel, material and everything else involved in the period around 1921, as compared to the times on and before 1913, except for two reductions on import freight rates, one in 1920, when import rates were restored, and the other during 1925, when through a change in commodity description, import rates were published on brick scale.

With the exception of the 10 percent reduction which was a sweeping and a general one in all industries, there have been no reductions in freight rates on American clays, while the several increases established during the war period and after, are still in effect.

I have neglected to mention one other territory in which a fine business has been built up in the pre-war period, and that was among the news mills in the extreme north of the United States, as far west as Minnesota and a considerable number of mills in Canada. This business has ceased to exist, as freight rates in some of these cases are today twice as high as the price of clay.

We are all familiar with the phenomenal growth of the newspaper mills, particularly in Canada, and to a certain extent in the United States, and it is entirely a reasonable belief that American clay tonnage would have grown vastly from this source alone if freight rates had not been so tremendously increased.

Our business in New England has utterly ceased to exist, and the same state of affairs prevails at other seaboard points.

With the wiping out of our business on the seaboard, and throughout New England, there was just one thing left for the poor, (Continued on page 69)

\* Paper presented to Twenty-ninth Annual Convention, The American Mining Congress, Washington, D. C., December 7, 1926.

† Edgar Bros. Company, Metuchen, N. J.



# THE BITUMINOUS COAL INDUSTRY\*

*Production Should Be Regulated To Meet Demand—There Should Be Larger Units Of Ownership And Management To Effect Central Direction—Such Plan Would Stabilize Output, Steady Wages And Prices And Close Unprofitable Workings—National Conference Advocated*

I AM sure the country will think it fitting and hopeful that an organization like The American Mining Congress should meet in an effort to blow away the fogs of misunderstanding that have hovered so long over the great industry which mines over 500,000,000 tons of coal every year—a third of the world's output—with its problems that so vitally affect every other American industry. I take it as a privilege to meet with you, and I assume that you want me to speak out.

For too long a time this great world industry has been obscured in mystery and left to chaos. For a number of years coal has been the only industry to afflict the country with a nation-wide strike. These results of misunderstandings in coal have become frequent and regular. These stoppages in the production of coal have been hurtful to the entire country. Because of that fact, no other American industry has attracted so much public anxiety. Because mining has been clouded so long in the haze of its own complexities, no other industry has so puzzled the public. Now, I feel sure the country expects to see a little daylight let into the coal mines. Where all other great American industries are organized on a basis of orderly scientific management, the country now looks to coal to get in line with these others and set another example of wise, business-like operation.

## MORE UNITY

It was my privilege to address your last session. On that occasion I laid before you a few of the thoughts that occur to a Secretary of Labor, who enjoys unusual advantage in surveying the facts as a whole. I then urged all parties directly concerned in the mining of coal to get together, to grasp the net- tles, and bring the industry to order and system. I realized then, as I do now, that in an industry such as yours this getting together is difficult. While the purpose of every operator is the single one of mining and marketing coal, this must be done under conditions often diverse. With the coal of each locality to be mined and marketed in a different way, many of the parties engaged must naturally be in sharp competition. These competitive conditions naturally bring differences of view and interest. Often these clashes of view and interest ap-

By HON. JAMES J. DAVIS†

pear hard to reconcile. But the more these differences are studied, the more clearly it is seen that mining can never be free of strife until all the parties engaged shall get together and wipe out their differences. If I have learned anything as Secretary of Labor, it is that the differences which can be settled only in getting together must not themselves interfere with that getting together. As



Harris & Ewing Photo

James J. Davis, Secretary of Labor

I have said before, the way to get together is to get together.

## PRESIDENT'S COAL COMMISSION

One means of getting together is through a full and fearless recognition of the facts. When I spoke to you before, I called attention to the efforts of state and Federal coal commissions to collect these facts and make them available. I then especially emphasized the important findings and recommendations of the recent President's Coal Commission. I expressed the hope that with this broad and complete report as a working basis, you might begin the task of adjusting the hitherto baffling economic evils confronting your industry. I still see no other way out of the present wilderness, which leads to nothing but unprofitable business for the operator, to intermittent employment for the miner.

The public itself best understands the evils of Government control. Such Government interference is clearly counter to the Constitution and to public opinion. The public no more wants it than you do. The country expects the mining industry to put its own house in order. It looks to mining to prove that it knows its own mind and knows its own business. Until the industry does this, it will continue to be harassed by ills. It will go on lacking public confidence. It will be subject to depressions, hurtful competition, strikes, unusual labor turnover, and unprofitable operation.

I can see no possible reason why operator and miner can not make use of all available information in cleaning house. They have this information. They have at their call the constant aid of departments of the Government, state and Federal, whose duty it is to promote industry and safeguard those dependent upon it. Every means exists for bringing your business to order. And that the public expects this to be done I had proved in the many kindly commendations I received when I urged this course before. Expressions of approval came not only from operators and miners but from leaders in other industries and from the public at large, all affected by the chronic chaos that now exists in mining, with the recurring stoppages or threats of stoppage.

In view of that commendation I had hoped that some constructive action would result. Instead the difficulties in the way of united action appear to have been too many. Operators in even the same state have been unable to agree on a common course of action. This being so, action was probably even less to be expected among those engaged in more unrelated operations in a score of states.

## OUTSIDE AGENCIES HELPED

It is true that regional and national associations exist for improvement on the technical side of mining. These have developed export trade. In this and for other reasons such agencies are well worth while and should be extended. But in the far more important business of weeding out the root evils of mining, even these have made little, if any, substantial progress.

During the past 10 years various outside agencies have striven to help your industry with but little success. We have seen legislative committees, the Fuel Production Committee of 1917, a Fuel Administrator from 1917 to 1919, in 1921

\* Address delivered before Twenty-ninth Annual Convention, The American Mining Congress, Hotel Mayflower, Washington, D. C., December 8, 1926.

† Secretary of Labor.

a Bituminous Coal Commission, and lastly the Federal Fact-Finding Commission. This last body made an exhaustive study of coal and returned a priceless aggregation of facts. As a result of all this, no other industry in the country has had the benefit of anything like such helpful aid on the part of the Government. What time and money you yourselves have spent, you know from your own experience. I am told it has cost you millions. And yet not a single step has been made toward taking advantage of all these labors by all these agencies. The industry goes on suffering, the country goes on suffering, because of this unwillingness or inability to unite, to organize, and put yourselves on an orderly basis.

#### TECHNICAL EVILS

At the outset the industry tolerates technical evils that should not exist. Why should American mining be three times as dangerous to life and limb, as regards the number of men employed, as in the mines of England, Belgium or France? What right has the present mining generation to waste the patrimony of the future by leaving 40 percent of the coal in the ground and extracting only 60 percent of the available supply, as the result of crudeness in method? In producing the more than 500,000,000 tons of bituminous coal in this calendar year of 1926 we shall leave approximately 400,000,000 more in pillars, stumps, thin and not immediately profitable coal, with losses by creeps and squeezes—meaning a billion tons less in our available coal supply.

What consistency is there in selling the steam grades of coal at cost or below the cost of production and relying for profit on the domestic or spot coal markets? These, gentlemen, strike me as unseasoned planks in any platform for the mining industry. If these are the planks on the side of management, do they not explain many of the rough planks on the labor side of the platform?

It would seem that the very magnitude of the problem would bring the various elements in mining to united action in solving that problem. Let me complete the picture of its magnitude. The industry is confronted by the fact that the Nation can not consume the potential bituminous output in its entirety. Nor is there reason to believe consumption ever will catch up to maximum production. This problem of overdevelopment is no new situation. Many of you will remember the experiment of several years ago when a series of suspensions was tried "to deplete an overstocked market." In those days the miners worked but a few days each week, and the Ohio report of that period gave their average annual earnings as less than \$375. Yet this problem of overproduc-

tion, or underconsumption, which has been with us for years, has yet to be tackled in any way but wrong end to.

The way to abate the evil of overdevelopment is to close, at least for a time, the less profitable mines. This you can not do unless the industry as a whole

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*"The public itself best understands the evils of Government control. Such Government interference is clearly counter to the Constitution and to public opinion. The public no more wants it than you do. The country expects the mining industry to put its own house in order. It looks to mining to prove that it knows its own mind and knows its own business. Until the industry does this, it will continue to be harassed by ills. It will go on lacking public confidence. It will be subject to depressions, hurtful competition, strikes, unusual labor turn-over, and unprofitable operation."*

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will bear the loss, and to do so it must be united. Yet if it were united, if disastrous competition were to cease, if all the elements in the industry were to get together on a practical, workable method of cooperation, this first and worst evil of overdevelopment could be ended almost at once.

With this worst of evils would go many of the lesser ills that result from it. So long as the industry operates with mines, men, and equipment equal to an annual production of 350,000,000 tons more coal than we can consume, it will go on being faced by the most serious economic situation in American history. As long as this overdevelopment continues, mining

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*"The way to abate the evil of overdevelopment is to close, at least for a time, the less profitable mines. This you can not do unless the industry as a whole will bear the loss, and to do so it must be united. Yet if it were united, if disastrous competition were to cease, if all the elements in the industry were to get together on a practical, workable method of cooperation, this first and worst evil of overdevelopment could be ended almost at once."*

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will go on being cursed with part-time employment and the discontent it breeds. The struggle to sell will become more severe. The operator will meet disaster. The poorly employed miner will be in a constant mood to strike. The public will be under the constant threat of a strike. Industry as a whole will be thrown into

confusion because of uncertainty in its coal supply. All this because of inability within the mining industry to put itself in business shape.

Think of it! As I told you before, the people of Illinois were horrified when the figures showed that 84 of their mines, operating full time, could produce all the coal produced from the 1,000 mines now working part time. Is that business?

#### STEADY LEVEL OF PRODUCTION NECESSARY

My prediction is that if mining does not soon put its house in order, the country will compel such action. The people of the United States are perfectly willing to pay for their coal a price that will yield a good profit and a good wage. But in return for the price they want their coal in a steady stream. As it is, the bituminous industry never appears to attain a steady level of production. One year it is in the slough of depression, with markets choked, storage facilities exhausted, mines either closed or running part time, wages reduced, miners and their families suffering want or out on strike. The next year the mining of coal may be for a period on the peak of prosperity, with wages rising, railroad haulage short of demand, and our other industries disrupted by the sudden rise in the price of coal.

During recent months this is the condition we have had on our hands. Over night we found an export trade knocking at our doors, as a result of the strike in the British mines. England, a coal-exporting nation, has had to put even herself on a war-time rationing of coal for home consumption. Countries used to buying British coal have turned to us. In September, 1925, we exported 283,000 tons of coal to Europe. In September, 1926, we shipped 1,756,000 tons. In a single week of that month, we sent 400,000 tons from Hampton Roads alone.

Naturally our home market feels the effect of this in higher prices for coal. With the end of the British strike, readjustment will come. Part of that readjustment will be a drop in the price of coal, and American manufacturers will again have to trim their prices to another shift in the cost of coal. Another effect of the readjustment will be felt by labor, and labor will pass the effect along to you. During this period of export activity, wages have gone up in some mining regions. In several large properties they have risen to the Jacksonville agreement, or above it, under cover of a bonus. When the activity stops, the bonus will be withdrawn. But the miners you have accustomed to a standard of living in these good times will not willingly consent to a lowering of this standard. It is human nature. And you will feel their resentment. Whereas a united mining industry, with all elements functioning together in

harmony, would more readily meet emergency conditions like these, and avoid these disturbing shifts in the price of coal and the level of wages.

#### A UNITED MINING INDUSTRY

A united mining industry would better handle such ills as the shortage of skilled miners which some bituminous regions report. Miners who have left the industry in slack times refuse to come back in good times. Not even these unusual wages that exist for the time being will tempt back many of your skilled miners who have permanently taken up other employment.

During this unusual export demand for our coal, the evils of overdevelopment at home have temporarily disappeared. At the instant when this trade drops off they will reappear. Then again will appear the waste of capital in poorly paying mines—capital that might be more profitably employed. Manpower that might be more productively used will be wasted again in idleness or part-time work. Frozen capital is always a loss to society. An unemployed laboring class means reduction of buying power in the public at large. This is putting it in practical terms alone. This is only the immediate cost of chaos in coal.

The indirect effects are beyond calculation, except as it must be apparent to any thinking person that with constant chills and fever in coal the whole of industry must catch the disease. When mining suffers from unemployment, from price fluctuations, from labor disputes, these ills are passed along all over the country. The American people know this now and will not endure it forever.

I can see but a single simple way out. That is production of coal sensibly regulated to meet the demand. I do not mean regulation by Government decree, but by the industry itself, with due regard to the law. To bring order out of this chaos larger units of ownership or management may have to be formed, but only by this amalgamation of existing companies can the necessary central direction be effected, with output and employment stabilized, wages and prices steadied, and unprofitable workings closed.

In answer to this the cry of "stifled competition" might arise. I doubt it. The American people have lost their fear of industrial corporations merely because of their size. We no longer ask how big they are, but how useful they are. We ask only about the quality of their product, the prices they charge, the treatment they give their workers.

Right at this moment the public sanctions amalgamations of existing railroad systems, as planned by railway executives and as watched by the Government. The public knows that these amalgama-

tions will lead to better returns to investors in railroad stocks and in better transportation to the public itself. If transportation is one of the foundations

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*"Let me urge again the pressing importance of a move to assemble a conference, covering every bituminous district in the United States. Controversial matters should have no place at such a conference. The sole purpose of the meeting should be a practical plan to make the mining of coal a prosperous industry, providing regular operation with sufficient output to meet commercial and domestic demands, to plan the expansion of export trade, to stabilize markets, to provide regular employment for workers, to organize shipping facilities. In addition to this needed legislation should be taken up, to interest railroad management and manufacturing interests more in the prosperity of mining than in securing coal for themselves at prices that make for mining at cost or at a loss. To such a conference you could invite the United States Attorney General, the Secretary of Commerce, the Secretary of Labor, the Federal Trade Commission, the Interstate Commerce Commission and other Government authorities, and I know they would be glad to lend their aid. Our entire business prosperity can not be sustained and made permanent if one of the great foundation industries is not regularly profitable."*

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of our national industrial structure, coal is another, and the argument that works for the betterment of one applies to the other.

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*"I can see but a single simple way out. That is production of coal sensibly regulated to meet the demand. I do not mean regulation by Government decree, but by the industry itself, with due regard to the law. To bring order out of this chaos larger units of ownership or management may have to be formed, but only by this amalgamation of existing companies can the necessary central direction be effected, with output and employment stabilized, wages and prices steadied, and unprofitable workings closed."*

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Artificial shortages of coal such as have been resorted to in the past should not be tried again. The need is for regulation. We have only to use with wisdom the mines we have and our ample

supply of skilled men to work them. Only through unified management and a wisely regulated output can wages be stabilized and strikes avoided. The strike loss to the country alone is sufficient warrant to bring public support to any orderly system that will free the country from the curse of these periodic stoppages that injure us all.

#### CONCLUSION

I have no desire to be classed as a carping critic or chronic finder of fault. The points I lay before you are based on knowledge that has come to me during the past five years from coal operators, miners, and men who have been in close touch with the mining of bituminous coal in various sections of our country. Serving at the head of the Federal Department of Labor has given me first hand facts in regard to our basic industries, and among them I have been especially interested in coal, the producer of power for all our industries, the commodity needed in all our homes. I have believed and still believe there is within the ranks of those engaged in mining, or dependent upon, the necessary skill and ingenuity to place the industry on a proper basis—the ability to deal with all its ills. Mining has all the needed resources of brains within itself.

I am sure that if existing Federal laws have ceased to meet existing conditions Congress will make any change necessary for the well-being of the industry, consistent with the well-being of our people as a whole. Let me therefore urge again the delegates to this mining congress the pressing importance of a move to assemble a conference, covering every bituminous district in the United States. Controversial matters should have no place at such a conference. The sole purpose of the meeting should be a practical plan to make the mining of coal a prosperous industry, providing regular operation with sufficient output to meet commercial and domestic demands, to plan the expansion of export trade, to stabilize markets, to provide regular employment for workers, to organize shipping facilities. In addition to this needed legislation should be taken up, to interest railroad management and manufacturing interests more in the prosperity of mining than in securing coal for themselves at prices that make for mining at cost or at a loss.

To such a conference you could invite the United States Attorney General, the Secretary of Commerce, the Secretary of Labor, the Federal Trade Commission, the Interstate Commerce Commission and other Government authorities, and I know they would be glad to lend their aid.

Our entire business prosperity can not be sustained and made permanent if one of (Continued on page 31)



## THE BITUMINOUS COAL INDUSTRY IN 1926\*

*A Story Of Bituminous Coal That Pictures An Industry With Vast Problems To Meet And How It Met Them, Not Only With Efficiency But In A Manner That Can Not But Earn Praise From An Interested And Understanding Public*

By WALTER BARNUM†

**D**URING the year 1926 the bituminous coal mining industry has been confronted with two unusual situations and it may well point with pride to the efficient way in which it has met these emergencies. I am referring to the fuel shortage which confronted our own country as the result of the strike of the anthracite mine workers and the world shortage occasioned by the strike of the mine workers of Great Britain. The former was purely a domestic affair if we include as a part of our normal domestic market our Canadian neighbors to the north; the latter was of world-wide proportions and is still affecting practically every coal consuming country in the world.

The situation created by the anthracite strike was a hold-over from the year 1925. That strike, as you know, began on the first of September, 1925; the agreement which terminated it was reached about the middle of February, but the anthracite output did not reach normal proportions for some time afterwards. The loss of anthracite production due to the strike was, in round numbers, 40,000,000 tons. The resulting deficiency in anthracite was fully cared for by a proportionate increase in the output of bituminous coal during the same period. The 30 or 40 percent of the anthracite production which is used for industrial purposes was readily replaced by bituminous except in a very few cases in which special uses or special equipment made the substitution impossible. It was in the attempt to substitute bituminous for anthracite in domestic consumption, for which purpose the major part of the anthracite output is used, that obstacles had to be overcome and these obstacles were much more largely psychological than material. Even laboring under such material and psychological handicaps the bituminous industry met the situation with such an adequate output of its product that there were no instances of industrial hardships or personal suffering for lack of fuel on the part of those willing to utilize the kinds that were available. Moreover, the industry met this purely domestic crisis with an unimportant advance in mine prices, amounting the country over to an average increase of only 12 cents a ton even for spot purchases, as reported on the impartial

authority of the trade publication "Coal Age."

The effects of the protracted strike of the mine workers of Great Britain have been much more profound and far reaching. To Great Britain itself the strike has been a disaster of great magnitude. Conservative estimates of the actual loss suffered by that country place it at no



Walter Barnum

less a sum than \$1,750,000,000. Additional losses will continue to accumulate for many months or even years to come while British industry is seeking to regain its normal condition. It is worth noting in passing that this disastrous event has taken place in a country where governmental meddling with the industry has been carried to the extreme; and it has occurred, not merely in spite of these ill advised experiments in governmental interference with private industry, but largely on account of them.

The British mine workers laid down their tools on the first day of May, 1926. For many weeks there was a complete cessation of mining operations. As the strike dragged on and all attempts to

compromise agreements failed, even though many of them were strongly urged by the government itself, miners finally began to drift back to work. Disheartened by the continuing disintegration of the strike the leaders of the mine workers finally acceded to the operator's demand for the substitution of district agreements for a single national agreement. This change has a lesson for our own industry. District agreements prevailed in this country from the beginning of collective bargaining with organized mine workers until it was replaced by a national agreement during the war largely on account of appeals of the Fuel Administration to the patriotism of the operators. If district agreements have been accepted as desirable for a country of the size of Great Britain, how much more necessary are they for a country as extensive as ours with diverse mining and living conditions.

Under ordinary circumstances the output of bituminous coal in Great Britain during the months from May to November, inclusive, amounts to 170,000,000 net tons. What the actual production has been during the period of the strike has not been definitely reported, but it is safe to say that it does not exceed 20,000,000 tons. If that amount is deducted from the normal production it leaves a total shortage of 150,000,000 tons.

The domestic shortage occasioned by the strike has resulted in the importation of coal into Great Britain from foreign countries in a volume far in excess of anything that that country has ever known before. In spite of these large importations the British coal supply has been so inadequate that all the war-time restrictions upon the use of fuel have been revived, coal has been rationed to domestic and industrial consumers alike and all except essential industries have been closed down entirely or operating on a greatly reduced time schedule. Available coal from the near-by countries of the continent of Europe has been entirely inadequate to make good the deficit and millions of tons have been bought by that country in the United States.

The effect of the strike was by no means confined to Great Britain. She has for many years been the chief coal exporting nation of the world and numerous widely scattered countries have depended upon her for all or a large part of their fuel. In normal years the exports from Great Britain during the

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seven months of the strike amount to approximately 44,000,000 tons. That amount has been entirely removed from the world market as the exportation of coal from Great Britain has been prohibited in the interest of domestic users. Even on the continent of Europe coal production has been subjected to serious handicaps, and it has been estimated by a competent French authority that Europe is entering the winter with a deficit of 100,000,000 tons in its coal supply. In spite of the utmost efforts of the coal mining countries of Europe these foreign consumers of British coal, like those of Great Britain itself, have largely turned to the United States to secure coal to replace the British deficit.

The foreign demand created by the British strike began to make itself felt in the United States early in the summer, but it was not until fall that its full effect was felt. This is shown by the record of our exports to which I shall refer in a moment. I want now to call attention to the fact that the peak of the foreign demand was reached at the very time of year when many American consumers are in the habit of entering the market to secure their entire winter supply of coal. The combined normal domestic demand and abnormal foreign demand faced the bituminous mining industry at the same time.

Let us consider the effect of this unusual foreign situation upon the bituminous industry of the United States. The output of bituminous coal in this country, which reached its low point for the year 1926 in May, steadily increased from that date until in the third week of November it attained the hitherto unapproached total of 14,253,000 tons for a single week. This is at a yearly rate of 740,000,000 tons, a total which exceeds the average production of the previous two years by more than 200,000,000 tons a year. This excess production constitutes the contribution of the bituminous industry of the United States towards meeting the world's need of fuel. For the entire month of November a record output of close to 60,000,000 tons was attained in spite of the loss due to the three holidays, election day, Armistice day and Thanksgiving. This monthly production is at the rate of over 700,000,000 tons a year.

Let us consider for a moment how much of this coal has been sent abroad in response to foreign demand. In normal years overseas exports of bituminous coal for the six months, June to November, inclusive, have averaged about 3,600,000 net tons. During the current year overseas exports for the same months have reached a total of 12,397,000 tons, or nearly four times their usual volume. Of these exports approximately 8,000,000 tons, or 64 percent of the total, have gone to Great Britain

herself, while the foreign consumers of British coal have taken nearly all of the rest of our increased exports.

A comparison of these export figures with the production figures previously given may serve to call attention to the fact that the exports themselves have absorbed only a relatively small part of our increased output. The reason for that is to be found primarily in the physical limitations of our vessel loading capacity. All Atlantic coal loading piers have been working at high tension and have made records not previously attained. It may safely be affirmed that if piers and transportation facilities had been available to move the coal from the mines to the vessels our exports would have been several times as large as they actually were.

This substantial tonnage of coal has been sent abroad without any impairment of domestic supply. When the export movement first began to assume large volume considerable uncertainty was felt in some parts of the United States as to the ability of the bituminous industry to meet the foreign demand and at the same time maintain its normal shipments to domestic markets. Under the influence of that uncertainty some consumers who had elected to play the market for lower prices rather than contract for their usual winter supply of fuel, started a buying movement which for a short time carried prices well above their previous level. It is to be set down to the special credit of the bituminous industry that it met the situation by producing a sufficiently large tonnage of coal to allay all fears of domestic shortage. While the rise in price was due more to the fear of a domestic shortage than to a shortage actually existing, as the recent stock report of the Bureau of Mines makes evident, yet it is worth noting that such a rise in price, whether well founded or not, brings its own remedy in the form of increased supply, and what the country needs in time of actual or anticipated shortage is more coal, even at some advance in price. From the unprecedentedly large output of recent weeks a sufficient tonnage has been going into domestic stocks to allay any possible fear of an approaching bituminous coal shortage.

There are two lessons to be drawn from the experience of the mining industry which I have been describing. The first is that estimates of the alleged over-development of the bituminous mining industry need to be examined with great care. If any capacity beyond that needed to produce a normal yearly output of 525,000,000 tons is to be rated as excessive, then it must be acknowledged that the industry is appreciably over-developed. But does not the experience of the country during the anthracite strike and the current British strike

serve to emphasize the fact that no such basis for measuring excess can safely be used? Even in a normal year, unless purchasers of coal can be persuaded or compelled to distribute their purchases uniformly throughout the year, necessary mine capacity must be reckoned as such capacity as is required to meet the maximum weekly demand, a demand which frequently exceeds 12,000,000 tons. But even that allowance does not go far enough. In the purely domestic crisis caused by the anthracite strike weekly output attained a yearly rate of 680,000,000 tons, while during the current British strike, as has already been pointed out, a maximum yearly rate of 740,000,000 tons was reached. It is evident that a large capacity in excess of average weekly demands is necessary as a guarantee of the ability of the industry to meet unexpected demand and thereby insure the country against a shortage of fuel.

The second lesson may be stated in the following terms: An emergency is said to exist whenever there is danger of a general, or even widespread local, shortage of coal, and the possibility of such shortage is the argument used by advocates of lodging so-called emergency control in the hands of some Federal agency. We have just passed through two such emergencies. They have been met in the one socially desirable way, namely, by the maximum possible output of bituminous coal. The strongest stimulus to increased output is the rise in price that the feat of shortage occasions, a rise in price which in a competitive industry soon works out its own cure. Can anyone imagine that the essential requirement of the situation, namely an increased output of bituminous coal, could have been procured as speedily or to such a degree under the rigid regulations of a Federal bureau as was brought about under the spur of private enterprise and individual initiative, spurred to action by the advance in price natural under the circumstances?

Thanks to this remarkable productive record of the bituminous industry, the country can face the approaching winter with no anxiety concerning its supply of bituminous coal. The mines have produced more than 14,250,000 tons of coal in a single week and the fact that even in that week there was unused capacity indicates their ability to make further additions to production in case of need. The railroads have proved that they are able to move such part of that production as is offered to them for shipment. In passing I can not refrain from calling attention to the remarkable increase in the efficiency of our transportation system brought about since the railroads were restored to private operation. This improvement is clearly

demonstrated by the remarkable contrast between the performance of the railroads during the present emergency and their virtual breakdown under similar conditions in 1920.

According to a recent report issued by the Bureau of Mines, consumers' stocks of coal on October 1 amounted to 43,000,000 tons, an amount well up to the average for that season of the year. Since that time additional millions have been put into consumers' stocks, and the existing reserves, plus the large amount on wheels and on the docks at the head of the Lakes, will be sufficient to meet the demands of the country for many weeks to come.

That statement is true even though consumption today is at a higher rate than the record of the last few years would lead us to expect. We have all heard of the encroachments made upon bituminous coal consumption by the use of petroleum and its products on the one hand, and hydro-generated electricity on the other, and to the further substantial shrinkage in demand by improved and more efficient methods of combustion. There can be no question but that the annual rate of increase in the consumption of bituminous coal has been retarded in those ways. I venture to think, however, that the peak of that influence has been passed and that we have already entered upon another period of rapidly expanding consumption of bituminous coal as industrial fuel, more or less keeping pace with the general industrial growth of the country.

I have dwelt at length on the record of the bituminous mining industry during the two emergencies through which it has passed during the current year because of the convincing evidence furnished by them of the unsoundness of the arguments advanced by advocates of regulatory legislation. I have left myself little time to take up other significant developments of the year. I can do no more than refer briefly to two of them. One of these developments is a continuance of the shift from union to non-union production which has been going on for a number of years. This movement has been brought about partly through increased mining capacity in non-union territory and partly by the change of mines, and even whole districts, from union to non-union conditions. The extent of the change is sufficiently indicated by the general statement that, whereas five years ago production was approximately 60 percent union and 40 percent non-union, by mid-summer 1926 the proportions had shifted to 70 percent or more non-union and only the remaining 30 percent union. The significance of this change lies in the protection thereby afforded the country against the danger of serious interruption in the supply of this

necessary industrial fuel through cessation of work by members of the miners' organization.

This development of non-union production has been one of the contributing factors that have brought a noteworthy geographical shifting of bituminous coal production in the east from states north of the Ohio and Potomac Rivers to the states lying south of those rivers. In 1923 62 percent of the production east of the Mississippi River came from the northern territory and 38 percent from the southern states; during the first six months of 1926 the percentages were, respectively, 52 percent for the north and 48 percent for the south. As the southern territory is somewhat more remote from the large consuming centers this shift in production has thrown an extra burden upon the railroads and I want to express my admiration for the effective way in which they have handled the resulting situation. Their remarkable achievement in handling record production with practically no car shortage is a noteworthy tribute to the efficiency of private management of industry.

The second development referred to above is the rapid adoption of improved methods of underground operation and especially the introduction of loading machines. The bituminous mining industry of the United States has always been in the forefront in the utilization of labor saving devices. No better evidence of this is needed than the widespread use of machines for undercutting coal. In 1924 70 percent of our entire output was undercut by machines, whereas, in Great Britain, our nearest rival in quantity of production, the percentage was less than 19.

The latest mechanical device to be developed is the underground loader. This machine has only recently been perfected and its introduction in existing mines present many difficult technical problems. Nevertheless the extension of its use has been noteworthy. According to a recent report by the Bureau of Mines the percentage of coal loaded by machines, while not large, increased between 1923 and 1925 by 232 percent. The report concludes with the statement that "Preliminary reports received from manufacturers of loading machines and mine operators indicate that when the complete figures for 1926 are collected, a further increase will be shown in the use of loading machines, in the number of mines employing them and in the total tonnage of machine-loaded coal." This record of the rapid introduction of loading machines, following as it does the example previously set by the adoption of mechanical haulage, mechanical cutters and other labor saving devices, offers ground for the assertion that the bituminous mining industry of the

United States, if left free to solve its own problems unhampered by uncalled for governmental interference, will always be found in the van of mechanical and technical progress, and that American industry can count upon the same sort of uninterrupted low priced supply of industrial fuel from that source in the future as it has enjoyed in the past.

## THE BITUMINOUS COAL INDUSTRY

(Continued from page 28)

the great foundation industries is not regularly profitable. The Government is vitally interested in the well-being of industry in general and will do its utmost to promote prosperity in mining in every constitutional way. But I repeat, I can see no future in coal so long as the industry ignores the unity and peace policies that saturate the rest of American industry. The elements in coal, now virtually at war with each other, must face about and pool their interests and energies for the common good of themselves and the public. The American people, after throwing legal guards about themselves, have welcomed this principle of unity in other industries.

They realize that organization, within due safeguards of law, brings down prices, saves waste, and places the entire working force of an industry in the open where its actions may be controlled by the force of opinion. The people expect this of the mining industry. In my estimation, if the mining industry does not soon yield of its own accord to this public wish, it will find the public wish becoming a public demand.

In the face of this probability, it seems to me, you and all of us are faced with an ethical question which should be honestly considered. That is, that the coal industry shall be peacefully brought in line with the other great American industries. In a nutshell, How long will the able American business men in the mining industry continue to evade a plain business opportunity to put themselves on a firm and lasting plane of prosperity, coupled with peace and protection for all the Nation's activities which have been so long in a state of jeopardy and disturbance?

And I am sure that if you follow the plan here outlined you will not only have a unified labor program but a unified industry.

Exports of iron and steel products from the United States during November totalled 219,830 gross tons, 47,760 tons greater than the exports for the month of October, the Department of Commerce has announced. Imports of iron and steel products into the United States during November totalled 81,259 gross tons, 571 gross tons lower than imports during month of October.



## THE ANTHRACITE SITUATION\*

*Influence Of Anthracite Upon Other Industries Is Practically Negligible—Operators Endeavoring To Increase Its Uses—Industry Has Almost Recovered From Effects Of The Strike—Competition With Oil Not Great*

By E. W. PARKER†

THE anthracite industry, although producing an output valued at a half a billion dollars annually, is, from an industrial standpoint, a thing apart, in that the influence of its product on other industries is practically negligible. The only other industries that are affected by the activities and prosperity of the anthracite producing region are those who furnish the timbering tools, machinery, explosives and other supplies. Of the total annual commercial production of something over 70,000,000 tons, 65 percent goes to the domestic consumer and the greater part of even what we class as "steam coal" is not actually used for industrial purposes, but is consumed in the heating of large office buildings, hotels and apartment houses, which is really domestic use. It is certainly not industrial.

Time was when anthracite was an important factor in our industrial life. At a time not so long ago, but a few of us can remember, anthracite was a more important fuel in blast furnace practice than either coke or charcoal. It was also an important locomotive and steamboat fuel. Anthracite was the chief fuel in the manufacture of water gas. It is no longer so. As gas and the kerosene lamp have been displaced in the field of illumination by the electric light, so has anthracite been driven from the industrial field by bituminous coal and coke. The annual reports of the Iron and Steel Institute now show that no anthracite is used as a blast furnace fuel. Its use as a steamboat and railroad fuel has entirely disappeared and the gas companies have almost entirely ceased to manufacture water gas. In all of these industries the larger lumps of coal were used—all of them larger than the domestic sizes of egg coal, which is now the largest size of domestic anthracite produced in any considerable quantity. Broken is still used to some extent in large domestic furnaces, but its total production, including that which is used in gas works and other industries, in the last two years was only 2.6 percent of the total output. The breaking down of these larger lumps in order to obtain the sizes demanded by the market results necessarily in the production of a large quantity of the small or undesirable sizes. As recently as 1890 the production of the larger or profitable sizes amounted to as much as 77 percent

of the total, while the percentage of pea coal and the steam sizes was only 23 percent. In 1925, the latest year for which we have this information, the production of the domestic sizes of anthracite was only 65.6 percent. Pea coal, which while now classed as a domestic coal, sells for little, if any, above the cost of production,



E. W. Parker

constituted 5.6 percent, while the steam sizes represent 28.8 percent of the production. This means, of course, that all of the profits to the industry must be obtained from less than two-thirds of the total production—that is, a deficit of over \$75,000,000 annually results from the production and sale of the steam sizes, and this loss has to be added to the cost of the domestic sizes. The securing of a more remunerative return on the smaller sizes of coal is the problem which is engaging the attention of the anthracite producing interests. It is only by doing so that under present conditions any hope can be held out for a reduction in the prices of the domestic sizes, which, every one familiar with the situation knows, are so high that competition of other fuels is menacing the welfare of the industry. Already this has been felt to a marked degree in the Northwest, to which the shipments in the last few years

have fallen off about 50 percent from pre-war figures, and in Canada, to which the exports were declining and the use of other fuels, particularly Welsh and Scotch anthracite, increasing, until the recent British strike cut off that source of supply and consumers in the Dominion have been compelled to resume the use of Pennsylvania anthracite.

This growing tendency of a restriction of the anthracite markets to a smaller geographical distribution is not pleasant to contemplate, the only saving feature being that the population in that territory is increasing, and, whether fortunately or unfortunately, the production of anthracite has practically reached its limit. It is not, like bituminous coal, capable of indefinite expansion.

With the idea of increasing the use of anthracite, the anthracite operators have established an Anthracite Coal Service, with branch offices in a number of cities and a corps of combustion engineers, among whose duties it is to aid consumers of anthracite in the securing of greater efficiency in the operation of their heating equipment and also to instruct dealers as well as consumers on the advantages, from an economical standpoint, that may be secured by the use of the smaller sizes of anthracite, particularly Buckwheat No. 1, either in types of furnaces especially adapted to them or for banking fires at night or when only moderate temperatures are required in the regular heating apparatus.

There is one matter on which the anthracite consuming public may rest reasonably sure, and that is that for four more years there is not going to be any interruption to the anthracite supply. Local and sporadic strikes, of course, we shall have, but there will not be any general strike in the anthracite region during the life of the present contract, which extends until August 31, 1930.

We have almost recovered, from a production standpoint, from the effects of the strike of 1925-26, the output for the present year up to the end of October having amounted to 62,540,000 gross tons, as compared with 56,392,000 gross tons in 1925, and 67,200,000 gross tons in 1924. In the three months from July 1 to September 30, the average weekly production of anthracite has been about 174,000 gross tons over the normal summer production, and in October of this year the output of anthracite gained more than a million tons over the same month in (Continued on page 80)

\* Paper presented to the 29th Annual Convention, The American Mining Congress.

† Director, Anthracite Bureau of Information.

## MARKETING MAY REVOLUTIONIZE COAL PRODUCTION\*

*Government Cannot Regulate Vast Coal Industry Without Wrecking Many Industries—Industry Not Mismanaged—Law Of Supply And Demand Must Obtain Until A Proper Distribution System Is Developed*

By HARRY N. TAYLOR†

I AM ENTIRELY in earnest in wanting to see something done to help bituminous coal distribution. I do not think there is anyone in the Government to whom it would be delegated to better our condition very greatly, for bituminous coal is a very complicated and widely distributed industry. We produce coal in this country in 28 of our States. We mine veins of coal that are in actual production of from 18 inches in thickness to 47 feet in thickness. We produce coal from veins as hard as rock to veins so soft that you can almost pull it out with your hands. So that mining conditions in the United States are just as varied as they possibly could be anywhere in the world. We have every condition of mine, of thickness of vein, of quality of coal, throughout our vast country. To regulate that and bring it down to a simple matter of marketing would be a task beyond compare, because certain people in certain districts want certain qualities of coal for certain purposes. One grade of coal for manufacturing iron is demanded by certain trade, and some other coal is called for domestic purposes in the same neighborhood, and so on. All have distinctive qualities, and people will send for coal thousands of miles when they have coal but of different quality right close at home.

Then, again, our markets are circumscribed by freight rates. Up to 1906 every freight agent in this country had a right to make a freight rate to meet the needs of any operator on his line, if he wanted to. And he put the rate up or down without any regard to the Interstate Commerce Commission. In 1906 the Interstate Commerce Commission became active, and called for a show down. The result was that the rate at which coal was moving, and not published, became the rate. Coal on some railroads had a lower or higher rate 20 years ago, and that rate became the rate for the district, and since that time all rates have been advanced on a percentage basis horizontally all over the country, and people who were being held up at that time still have

those inequalities saddled on them. And locations that had an advantageous freight rate at that time have had those rates perpetuated.

What is the result? Great natural fields like Ohio have been put at a dis-

agent wanted to do at that time, whether high or low, and it was left as a heritage to that particular field. And the low rate that obtained naturally invited capital, and capital went to low-rate fields. The business expanded, and likewise capital ceased to flow into other fields, and brought production in the other fields to more or less of a standstill. So it is a question of distribution of our coal in which the freight rates play the most important role.

We recently had demand for export coal by reason of conditions in Great Britain. Mines that were so located, or rates that were favorable, so as to get coal to the seaboard, were immediately called upon for enormous amounts of coal. Coal was bid up from \$2.00 a ton at the mine to \$6.00 a ton; and our good governmental shipping board, who were quoting a rate of \$2.50 a ton, boosted the rate to \$7.00 a ton, making the buyer over there pay \$5.00 more for freight. So that our opportunity to get in the export market was hurt when the price was boosted at the mines and by the big advance in ocean rates. That made an emergency market, so now they have quit buying American coal.

The question is asked: Why don't we regulate this? At the time that boosting was going on the production of bituminous coal climbed to almost 14,000,000 tons a week. And yet that increased production was not produced in the whole country, but in a small portion of the country that had access to tidewater. On the other hand, Indiana, Illinois, Iowa, Kansas, Arkansas, Oklahoma, and Wyoming mines did not



Harry N. Taylor

know there was a strike in progress in England, so far as they were affected. The same old condition still existed in that section of the country. There was no advance in price, and cars were standing on the tracks seeking a market. There was no increase in price in the western market. If those western mines had been called upon to increase their output like the eastern mines were called upon, instead of there being a weekly output of 14,000,000 tons it would have been nearer 20,000,000 tons. We have a capacity, if we can get the cars, of 20,000,000 tons a week. And yet we cannot use in this country over 10,

\* Address delivered to Twenty-ninth Annual Convention, The American Mining Congress, Washington, D. C., December 8, 1926.  
† President, United States Distributing Corporation.

000,000 tons of bituminous coal a week in normal times. With a potential supply of double that tonnage, the law of supply and demand must govern. The fellow who is on the ground and wants it will get it. If we get into a battle of prices, so that the price offered is low, then the high-cost producing mines cannot go on because they are losing money; it is a condition of the survival of the fittest, but that will not cure things at all. It will shut down certain mines. And then when they shut down and demand increases again the price goes up and they will open again, and in a short time the offerings will ruin the market.

We had that sort of flurry not over a month ago. What happened? These mines that were unable to run on the Jacksonville scale before that time, then reopened and paid the scale. The mines who had gotten their men back at the 1917 rate immediately advanced their price to the Jacksonville scale. The Pittsburgh Coal Company, not wishing to say that they were recognizing the miners' union, paid 5 percent above the Jacksonville scale. Then when men found their miners going elsewhere they paid the same scale. So that the whole eastern part of the country was put back on the Jacksonville scale or over it.

And then what happened? Inside of two weeks the bubble burst, and today they are back where they were, having no market, with a higher scale tied on them so they cannot work except at a greater loss.

Having coal of all these different qualities, and different mining conditions, and different freight rates, and men paying \$6.00 a ton in one part of the country, and yet in another part of the country not able to sell coal at \$1.50 a ton, shows it is a matter of distribution, not production, that has played havoc with the bituminous coal trade.

And you cannot shut down high-cost mines as the Secretary of Labor suggests might be done without confiscating a man's property, even if it is a high-cost mine. If you shut them down you ruin the merchants and everybody else who have built up their business on the production of those mines. So the inequalities suggest that it is all a matter of distribution, of improper freight rates on an unscientific basis. And if you change those conditions you will ruin many other industries that have built themselves up around the local coal supply. For instance, the coal supply was the magnet that brought them into that section. If you attempt to reorganize the industries that have been built up during a period of, say, 30 years, you will ruin not only the coal business but the other business depending on coal.

I do not believe there are many men who understand this bituminous coal business from a nationwide standpoint. There are many men in Pennsylvania who understand conditions in Pennsylvania, and there are many men in Ohio who understand conditions in Ohio, and there are many men in Illinois who understand conditions in Illinois, and who know conditions in their particular section better than anywhere else; and that is true of men in Kansas, and in Wyoming, and even in far-off Washington on the Pacific coast. They know what they are up against in their particular sections. But you cannot regulate a nationwide situation by the Government unless you have someone who knows conditions from one end of the country to the other. He must know the labor conditions, market condition, transportation conditions, and general commercial conditions in a nationwide way on the basis of the coal supply and consumption. When it is said that the coal industry is poorly managed, I say that I have been in this game since I was a boy, for 44 years, and that I have been around coal mines, and have seen the miners working all during those years, and now see miners' sons coming back from college with a technical education and entering the mines; and knowing the conditions during those 44 years I want to say that there is no industry that records greater effort, greater progress, than the coal industry. When they say it is not well managed I resent that statement. I say that it would take a superman to bring the industry, with all its handicaps, into a better working machine. I believe it can only be done in theory even should the Government attempt it.

I worked out a theory how to cure the ills, but I know well enough that the human element would have to be taken into consideration. We all know that there are certain districts, and we will say Somerset, Pa., where there are possibly 60 mines producing coal of similar quality, with a similar market, and they all sacrificing their product trying to get more business than the market will absorb.

It is the same in the Hocking Valley, Ohio, district, in Franklin County, Ill., and in districts all over the United States. If it were possible to go into a district like Franklin County, Ill., where they have the same vein, and the coal is transported by the same railroads, and if all those operators would submit to an appraisal of their property, and if they would then organize a company, and if the property of one company was worth, say, 10 percent of the whole, and another mine was worth 15 percent, and so on, making up 100 percent, and they would issue stock that represented the valuation of the total

property; and then let a board run the mines that were necessary in order to produce the coal that would find a ready market at a profit, and distribute that profit over the entire district, by dividends so that every man shared in his proportion, that is, in the proportion that his property was put in the company, he would not then care whether his mine was shut down or not. And if he were to get a profit out of the total business, you would not thus confiscate the mines of men who had conditions that made it impossible for them to make money in the highly competitive market, and everybody would participate in the profits of the district, then you would eliminate the local and internal competition. But, as I said before, I am not a theorist, and I know human nature would prevent such a thing, because you would find many men who would thus lose their jobs when economics were put in and who would oppose such a plan. But theoretically this might be done.

I do not believe the Government, or any one human being, can take this vast industry, extending from the Atlantic to the Pacific, and in 28 States, and cure it whether they regulate it or not, without wrecking a lot of industries, not only the coal industry but industries built up on the coal industry. And I think the work that has been done and the hours put in by the men engaged in this industry, who have been forced to do it in order to live at all, and the improvements installed in the way of mechanical loaders, haulers, and so forth, speaks for itself as to their efforts. And when you compare our industries with France and Belgium and England, those of us who have been there and know their conditions will answer at once that they are 40 years behind us. America is ahead of any coal-producing country in the world. They are just commencing to copy us. It is only within the last four or five years that they have even begun to do it. And England will have to do it or she will pass out as an exporting nation.

This is the situation as I see it. I want to say that some of the finest men and some of the best minds I have ever known in my life are engaged in the coal industry; and through the National Coal Association, and through local coal associations the subject is studied day and night. They go into every phase of management and mining, and of labor, use of electricity, and the proper application of power, ventilation, and all these things, as well as that important thing called marketing. These are just a few of the conditions met with in this industry, and all must be met by the management, and there are outstanding men in the industry who are as able and as zealous as (Continued on page 43)



# HOW EFFICIENT MANAGEMENT HELPS SOLVE INDUSTRY'S PROBLEMS\*

*There Are Three Certain Avenues Leading Toward Betterment Open To Coal Industry: Coal Storage, Mechanical Loading, And Doubling Load Factor Through Double And Triple Shifting—The Possibilities Of Mechanization*

By EUGENE MCAULIFFE †

THE solution of the problems that surround industry will ever rest with those responsible for the existence and conduct of same. There is no short road to grace; on the other hand, the certain industries which have attained a reasonably smooth running basis reached same by the age-old process of trial and error, plus persistent thought and strenuous work.

Engaged in the production of coal, I will confine my suggestions to the results that may be gained for the particular industry which employs some 750,000 men, and which in addition furnishes the railroads with a very material percentage of the tonnage that goes to make up their daily load, a load which not only reserves the right to fluctuate violently between seasons, but, in addition, thereto to shift itself in multiplied volume from one field to another, almost in a night; the stream of traffic derived therefrom likewise, at times, drying up with astonishing rapidity.

There are three certain avenues leading toward betterment broadly open to the coal industry, two of which have been made the subject of frequent discussion, the third, while generally employed by the metal mining industry in the United States and in coal mines in Europe, has been in this country very generally ignored by our coal industry. The first avenue toward betterment I will refer to but briefly, the storage of coal by the consumer, a work that the railroads and other large public utility users should lead in. The effect of a generous policy toward the storage of coal at the point of consumption would be far-reaching. The gain would rest with the user and the railroads, to the railroads' dual interests of fuel supply and traffic most of all. I will not take the time to repeat the details of the advantages that would be attained by the general adoption of a national coal storage policy.

The second great opportunity for increased efficiency lies in the direction of extending and hastening the process of translating the labor now employed in loading coal by hand within the mines, to that of manufacturing, operating and maintaining power-driven machinery.

Perhaps it is worth while to picture the task of the men who shoveled 560,000,000

tons of coal from the mine face to pit cars in 1925—this stupendous accomplishment can best be visioned by a simple comparison. Between 2500 and 2000 B. C., the pyramid of Cheops was built, absorbing the energy of 100,000 men for 30 years. Originally 768 feet across the base and 482 feet in height, its



Eugene McAuliffe

masonry content approximated 3,041,148 cubic yards. After excluding the 25,000,000 tons of coal loaded by strip pit shovels on the surface, and mechanical loading devices employed underground the 1925 production of coal in the form of "run of mine" would make a pile covering a square mile of surface with a perpendicular face 800 feet in height, the coal content of this pile approximating 830,000,000 cubic yards, or a volume equal to 272 times that of Cheops. If this pile was erected in the outskirts of Washington, millions would come to view it. What a human task would there be evidenced; 56,000,000,000 separate shovelfuls lifted over the side of perhaps 500,000,000 mine cars, each car placed either by hand labor or by animal or power haulage.

The United States Bureau of Mines informs us that 1,879,726 tons of bitumi-

nous coal were loaded underground in 60 mines in 1923; in 1924 the number of mines loading mechanically had grown to 83, the tonnage so loaded 3,495,222; while in 1925 the number of mines had further expanded to 95, the volume of coal mechanically loaded 6,243,104 tons, an increase in two years of 232 percent. Doubtless 1926 will show even better. I am sure the progress now being made exceeds that shown for the undercutting machine, which in 1891 undercut 5 percent of the tonnage of bituminous coal, this portion growing at the rate of approximately 2 percent per annum and now running to 67 percent of the total. While the coal-loading machine is not yet being received with open arms by all operators and their employees, the birth pains it is now undergoing are not unlike those experienced by the railroads when the air brake and automatic coupler sought recognition. The advantages that will follow mechanical loading underground are both visible and invisible, but withal definitely material.

If no other incentive toward the further mechanization of our mines than that of obtaining a sufficient supply of labor existed, that situation alone warrants the transformation. Heretofore much of our coal mine labor has been recruited from eastern European nations. With millions of war-worn alien people turning toward America as a haven of refuge, our Government found it necessary to restrict immigration in order that complete submersion be avoided. The extent to which alien immigration of the classes that enter the mining industry, coal and metal, is now available, and is well expressed in the report of the United States Department of Labor, Bureau of Immigration, for the six years ending June 30, 1926:

It is quite evident that an annual addition of 12,742 miners and laborers will go but a short distance in the work of supplying the force necessary to meet expanding requirements, retirement and death losses. Labor, like coal, is an exhausting asset.

The direct economies that follow the increase in tons per man shift affect the cost factor, but in addition thereto a reservoir of labor is made available by mechanization in the form of young men who, after passing through the excellent schools which many of our mining communities have developed in recent years,

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† President, Union Pacific Coal Company.

Admissions	1921	1922	1923	1924	1925	1926	Total	Average per year
Miners .....	1,746	881	2,550	3,987	1,467	2,102	12,683	2,114
Laborers .....	160,564	82,726	83,652	108,001	34,784	43,543	463,170	77,195
Total .....	162,310	83,607	86,102	111,988	36,251	45,645	475,853	79,309
Departures .....	4,145	3,257	803	954	953	855	10,967	1,828
Miners .....	135,207	100,058	32,912	37,259	49,890	33,107	388,433	64,739
Laborers .....	139,352	103,315	33,715	38,213	50,843	33,962	399,400	66,567
Total .....	22,958	62,387	73,725	73,725	11,688	76,453	12,742	
Excess of admissions .....	69,708				14,592			
Excess of departures .....								

will gladly seek work in mines mechanically equipped, but who, on the other hand, do not wish to toil alone at the face of a room or entry. One of our companies, with but a portion of its tonnage loaded mechanically, employed 26 high school graduates with the closing of the last year, of school, and what is more important, these boys wish to remain. May I suggest to the many operators who are either passive to, or perhaps opposed to the adoption of coal-loading machinery on the ground that their particular mines are not adapted to machine loading, etc., that somewhere there is a machine available and sold by someone that will, if accepted without prejudice, do the job. I have no hesitation in saying that loading machine success is yet 80 percent mental attitude.

The logical solution of the labor supply problem lies in the direction of making mining employment sufficiently attractive to the sons of existing mine workers. Our school facilities have been developed to a high standard and thousands of boys coming from the homes of mine workers are being graduated yearly, all anxious to find a job less arduous than the one their fathers were compelled to take; these boys, a large percent high school graduates, have a smattering knowledge of electricity and mechanics, and the universally used automobile has made every American born boy familiar with machinery. It is this skill, plus capacity to think clearer, which we should attempt to capitalize. The mechanization of our mines will completely transform our mine labor situation.

The third lead toward betterment lies in the direction of doubling the present inordinately poor load factor through the double and triple shifting of the mines, a practice generally employed in metal mines and reduction plants, and likewise employed to a material extent in coal mines in Europe. The adoption of a coal storage program would reduce the idle time due to seasonal demand, and that is most important, affecting, as it does, not only the capital invested but likewise the labor employed. That betterment should be pursued, but separate therefrom, extraordinary savings can be made by extending the hours per day in which coal is produced, thereby obtaining a double or triple tonnage over which to divide the capital charges, taxes, cost of

pumping, ventilation and such items of maintenance, including rock falls and timbering, that are influenced by the time element.

The savings that would flow from the multiple shifting of coal mines would startle those who develop the courage to work out the problem. For example a careful computation, checked by several competent experienced coal operators and mining engineers, has demonstrated that the total cost of mining 7,350,000 tons of coal taken out through a shaft equipped to handle 2,000 tons in 8 hours would be reduced by double shifting \$897,750; this on the basis of a market demand of but 175 days per year. This sum, if reinvested annually at 6 percent for 21 years, the life of the mine working 175 shifts per year and necessary to its exhaustion, would reach the startling sum of \$2,220,116.

I often wonder if we who operate the mines do not spend too much time decrying labor rates that our irregular operation makes necessary in order that an adequate annual wage can be earned, ignoring very largely the potentialities of methods, the adoption and adaptation of which would pay even greater returns than reduced wage scales. If we could make up our minds to think of the coal industry as a manufacturing industry, translating labor and raw material into a valuable product, thereafter exacting cost plus a fair margin of profit, perhaps we would have fewer problems. It would doubtless help to think of coal mine management and salesmanship in terms of steel or automobile manufacturing, or as a public utility, as a railroad or an electric light and power plant, for example. It is even possible we could gain something by patterning after our competitors, the oil men, who in recent years seem to have won for themselves at least freedom from receiverships.

## 29TH ANNUAL CONVENTION

(Continued from page 11)

abandonment of this plan in so far as the mining industry is concerned, as to which depreciation rates are impossible of equitable and consistent standardization, but must be determined according to the peculiar conditions of each individual case; and to take such further action, by and with the advice of the General Tax Committee of

the American Mining Congress, as may be deemed necessary and proper.

### Resolution No. 14

## REGULATION AND CONTROL OF THE COAL INDUSTRY

Introduced by LEE LONG and W. E. E. KOEPLER

WHEREAS regulation and control of the coal industry are proposed in many bills now pending before Congress; and

WHEREAS business is best conducted by those who are financially dependent on it and experienced in it; and

WHEREAS the results which have attended governmental interference in the coal industry in Great Britain are a striking example of the costly consequences of such a policy: Therefore be it

Resolved, That the American Mining Congress, in the interest of the public and in furtherance of its long established position, hereby restates its opposition to any proposal to extend governmental control over business, and particularly to the singling out of any one industry for such regulation.

### Resolution No. 15

## INLAND WATERWAYS IMPROVEMENT

WHEREAS, owing to the bulky nature of mineral products, cheap transportation is fundamental to the prosperity of the mining industry, especially so where its finished products are to compete with similar products made abroad with cheaper labor and cheaper transportation; and

WHEREAS we are nationally engaged in and are about to realize upon a comprehensive program for the canalization and improvement of our inland waterways: Therefore be it

Resolved, That this great national undertaking meets with the hearty indorsement of the American Mining Congress.

### Resolution No. 16

## RESOLUTION OF THANKS

Be it resolved, That the thanks of the convention be extended to the speakers who have addressed it, to the press, to the Mayflower Hotel, and to the many other organizations and individuals that have assisted to make the meeting profitable and pleasant for all in attendance.

Delegates and visiting ladies were guests of The American Mining Congress at a get-together luncheon in the Chinese Room of The Mayflower on the opening day. The organization again was host at an informal reception and dance on Wednesday evening. The ladies of the convention motored to the Congressional Country Club for luncheon on Thursday noon, the guests of Mrs. J. F. Callbreath. These features of entertainment were in addition to the program presented at the annual banquet.

# DISCRIMINATION AGAINST INCOME OF CORPORATIONS UNDER PRESENT INCOME TAX RATES\*

*American Mining Congress Convention Told Remedy Lies In Reduction Of Present Corporation Tax Rate, Giving Stockholders Full Exemption On Corporate Dividends Or A Credit Such As That Given For Other Taxes Paid At The Source*

By HENRY B. FERNALD†

THE impossibility of framing any tax schedules so that they will apply with entire consistency, fairness and equity is well recognized. Therefore one of the cardinal principles of taxation is that the rates must always be kept low enough so that the inevitable inequities will not become grossly unfair to those who happen to be so circumstanced as to bring upon themselves the maximum effect of the taxing provisions. Whatever standard of perfection we may attain in the phrasing of our laws and the stating of the schedules thereunder, we can not hope to eliminate a certain amount of inequity and unfairness. Not even a superwisdom, such as we are sure does not exist in legislative halls and which our best students of taxation do not profess to have, could hope to achieve a result of perfect fairness and equity throughout our varied business affairs.

But while we may not hope for absolute equity to every form and type of profit-making activity, we may well scan our tax structure to see if there be certain points of marked inequality. In doing this, it is well to bear in mind that while the Government can well afford to look with complacency on an average result, even though that average may be obtained from extreme peaks and depression, the individual taxpayer who is placed on a high peak of taxation can not adopt this same complacent attitude as he looks at those on lower levels. If there be only the occasional taxpayer to whom a discriminatory provision may apply, the Government can well afford to eliminate these peaks with no material effect on its average result. If, however, there is a discrimination which affects such a large number of taxpayers that it will materially affect the aggregate result to the Government, clearly it should, if possible, be eliminated.

Unfortunately, there has been some tendency in the past to hold up certain particular individuals or corporations or certain particular transactions or types of transactions as particularly meriting drastic taxation. Then, when provisions had been framed intended to meet these cases, other provisions for exemption or relief had to be drafted to prevent these

more drastic provisions from applying to those against whom they were not intended to be directed. It is this spirit which has been responsible for many of the complications of our income tax laws. Perhaps one reason for as much of this as we have had in the past was



Henry B. Fernald

the imposition of emergency taxation at rates beyond anything that could be considered as a reasonable basis to apply to the income of the ordinary citizen. This not unnaturally stimulated a search for those who stood out from the ordinary run and gave some feature which could be used as an excuse for their particularly heavy taxation. This situation has now passed and we may perhaps hope that future legislation will not be framed in anything of this spirit. It has, however, left its impress on our present income tax structure.

As we look over this income tax structure, we find three units recognized for taxation by our present and prior Federal income tax laws, viz: the individual, the trust, and the corporation. Except under the excess profits tax law of 1917, partnerships have not been recognized as taxable units, but the income of a

partnership is taxable to its members as if each received individually his proportionate share of the partnership income.

The trust is, however, taxed virtually the same as if it were a separate individual, after taking into account such distributions as it may make of its income, and any income which is taxed against the trust is not again taxed against an individual beneficiary.

These general provisions of the law were discussed more at length in my paper on "Practical Effects of Varying Income Tax Rates on Incomes of Individuals, Trusts and Corporations," which appears in the Proceedings of the Sacramento Convention of the American Mining Congress in 1924. In that paper I presented and discussed certain examples of the effects which come from applying the rates of the 1924 act to these several taxable units—the individual, the trust, and the corporation. Manifestly, the examples given in that paper, which were worked out at the rates of the 1924 act, would show some materially different results at the rates of the present act of 1926.

Under the 1924 act the corporation was subject to a flat 12½ percent tax on its income and was also subject to a capital stock tax of \$1 per thousand dollars of "the fair average value of its capital stock." The individual or the trust was subject to a normal income tax of from 2 percent to 6 percent and to surtaxes running as high as 40 percent. The now-existing revenue act of 1926 places a flat 13½ percent tax on the income of corporations but eliminates the capital stock tax. On the income of the individual or the trust it places a normal tax of from 1½ percent to 5 percent, with surtaxes running as high as 20 percent. Let us assume that the substitution of the 13½ percent tax on corporate income in place of the former 12½ percent tax on income, plus a capital stock tax, is not really any change in our scale of corporate taxation; in fact, it is no change if the corporate income is 10 percent of the valuation upon which the capital stock tax would have been levied. Even though we may say correctly that there has been no real increase in the corporation tax rate, it is notable that there has not been a decrease in the corporation rate, although a notable decrease was made in the individual rates.

\* Address delivered before Twenty-ninth Annual Convention, The American Mining Congress, Washington, D. C., December 9, 1926.

† Certified public accountant; member, General Tax Committee, The American Mining Congress.



To point out this fact there has been a decrease in the rates on individuals without any decrease in the corporation rate should not be considered as any criticism of the reductions made.

The reduction of the individual surtax rates was an economic necessity because these rates were formerly so high that they constituted an economic obstruction to normal business activities, besides having the effect which high tax rates always have of emphasizing other inequities in the law and making the assessment and collection of these taxes more complicated and difficult. The reduction of the maximum rate from 40 percent to 20 percent was a wise move, and I hope we may see a still further reduction in these higher tax rates with the further elimination of friction between the Government and taxpayers which can come with the reduction in rates and with the further simplification of the law which a reduction in rates will make practicable.

Whether there was any economic need or justification for increasing exemptions and reducing the normal taxes may well be doubted when we look at the scale of taxation effective in other countries. It may also be doubted whether it is real political wisdom to try to make a majority of voters feel that they are not paying any substantial part of the costs of the Government. This is not to say that all taxation does not sooner or later in one way or another become a burden to be borne by the entire people. It is merely to say that while reduction in higher surtaxes was an economic need, the reduction or elimination of taxes on lower incomes was simply inspired by a desire to give to a large body of taxpayers a welcome reduction or elimination of taxes by them. While this was done as to incomes derived from non-corporate sources, it was not done as to income which came through corporate sources, but the income of these individuals still had to bear its full 13½ percent tax.

Perhaps the small stockholder has not recognized this and has been satisfied to believe that he paid little or no tax on dividends, although the fact stands that his share of the corporation's income which otherwise would have been distributable to him has been reduced by the tax paid by the corporation.

We must admit that it is difficult to say how, if we are to tax corporation income, we could in any practical manner eliminate from the corporation tax any part of that income on the basis that certain stockholders would not individually be subject to the tax; or to devise some practical scheme to credit or refund to those who themselves paid no tax the amount of the corporation tax which had been paid on the income ultimately distributable to them. I am not

trying to urge any such plans but would point out that the corporation tax rate is not only a question of interest to those of large incomes but that it directly affects a far greater number of stockholders of small incomes.

Perhaps the individual who is simply one of thousands of others holding a few shares each in one of our great corporations may not appreciate how directly he is affected by the taxes which the corporation may pay. This is not, however, the situation of those who have what we may term their own businesses conducted in corporate form. Such people look very definitely on whatever taxes the corporation may pay as simply being paid for their own account. They see a marked discrimination in the fact that while the 1926 act gave reductions on incomes from non-corporate sources, their incomes from corporate sources may be subject to the same total tax as under the prior act.

A reduction in the individual's normal tax from which dividends were exempt, without any reduction in the corporation tax was discriminatory. For example, take the case of a man with \$10,000 of income, which was subject only to the normal tax of 6 percent in 1924 and 5 percent in 1926; in 1924, then, he was paying 6 percent on income which he received from non-corporate sources, whereas on income received through a corporation he was paying 12½ percent income tax, plus a capital stock tax, which we will assume to be an effective rate of 13½ percent of the income. This was, therefore, a discrimination of 7½ percent against the corporation income. In 1926 he is paying on non-corporate income 5 percent, but on income received through corporations 13½ percent—a discrimination against the corporation of 8½ percent.

You do not give him consolation by pointing out to him that he is paying no higher tax than he did formerly, whereas he simply sees the former discrimination of 7½ percent now increased to 8½ percent. If he has a good memory, he goes back to our earlier tax laws when there was no such discrimination against the corporation.

It is a peculiar, unintentional effect of our tax structure that this discrimination is reduced as surtaxes increase. The individual subject only to the normal tax simply stands in the position of having his entire tax paid at the source by the corporation instead of having him pay the normal tax to which he would otherwise be subject. As soon as we run into the surtaxes we have the situation that the corporation has paid the corporation tax and the individual pays his surtax on only the balance. If, for example, the individual surtax rate is 10 percent and the corporation rate is 13½ percent, the aggregate tax to be paid is not 23½

percent, since the individual will only pay his 10 percent surtax on the remaining 86½ percent after the corporation tax has been paid. The total tax is, therefore, 13½ percent plus 8.65 percent, or 22.15 percent. It is somewhat difficult to present extended examples taking this differential constantly into account, but the following examples will serve to illustrate its effect:

	Percent 1924	Percent 1926
<b>On \$25,000 income:</b>		
Normal tax .....	6	5
Surtax .....	7	7
Total normal and surtax. ....	13	12
Corporation tax rate.....	13.50	13.50
Surtax on remaining balance equivalent to.....	6.055	6.055
Total on income through corporation .....	19.555	19.555
Discrimination against corporate income.....	6.555	7.555
<b>On \$100,000 income:</b>		
Normal tax .....	6	5
Surtax .....	36	20
Total normal and surtax. ....	42	25
Corporation tax rate.....	13.50	13.50
Surtax on remaining balance equivalent to .....	31.14	17.3
Total on income through corporation .....	44.64	30.8
Discrimination against corporate income.....	2.64	5.8

Of course, all of the above is on the assumption that it is the individual stockholder who is the real party of interest in the corporation and that ultimately he will receive distributed to him all the income received by the corporation.

To get the proper perspective on this matter we may look back over our series of income tax laws.

The 1913 law imposed a 1 percent tax on corporations and a 1 percent normal tax on individuals from which dividends were exempt. The tax on corporations was looked upon in that law simply as a payment of tax at source, with the elimination from the individual's tax of the amount which the corporation had already paid. Of course, if the individual had no taxable income he was in the position of having had this amount deducted from his share of the corporate income or, in other words, of having been required to pay the 1 percent tax on the corporate income, regardless of whether or not he was otherwise taxable. The amount was, however, small and could hardly be termed discriminatory against the corporation.

The 1913 act did, however, require a corporation to pay tax on dividends received by it from other corporations which was on a theory that there was something essentially wrong in the holding corporation idea and that the holding by one corporation of stock in another corporation was something which should be penalized and discouraged. Dividends received by the individual

were under the 1913 act subject to the surtaxes beginning with 1 percent at \$20,000 and running up to 6 percent for income in excess of \$500,000.

The 1916 act raised the corporation tax to 2 percent and the normal income tax to 2 percent but still exempted dividends from the normal tax, so that the tax paid by the corporation was again simply a tax paid at source with no net additional tax due from the individual because his income came through corporate sources. However, it still followed the 1913 act in requiring the corporation to pay the income tax on dividends which it received from other corporations. Surtaxes were likewise increased under the 1916 act so that dividends were subject to surtax rates of 1 percent at \$20,000 running up to 13 percent on income in excess of \$2,000,000. (The capital stock tax was also imposed by this act, but I will not attempt, at this point, to give consideration to its effect.)

The 1917 act did not repeal the 1916 act, although it did amend certain of its provisions and stated tax rates which were to be applied for 1917 in addition to those of the 1916 act. There was thus added an additional corporation income tax of 4 percent and an additional normal income tax of 2 percent, with the result that the corporations paid a 6 percent income tax, whereas individuals were only exempt from their normal 4 percent tax on dividends received. Thus, for the first time an income tax was imposed on corporations in excess of the exemption accorded their earnings when distributed to the individuals. The 2 percent tax of the 1916 act still had to be paid by corporations on dividends received by them from other corporations, but the additional 4 percent did not apply to such dividends. The 1917 act, of course, also brought in its heavy excess profits taxes on corporations with no exemption to the individuals for any such taxes paid by the corporations.

We can not say that it was in 1917 that corporations were first recognized as separate entities for income taxation, but the taxes imposed by the 1917 act were the first taxes against corporations which were not taken into account in computing the tax of the individual. Of course, the entire 1917 act was wartime legislation, full of inequities and inconsistencies; let us say kindly of it, that its one purpose was to raise wartime revenue with the thought that in war times the Government was justified in seizing upon incomes as it did on property and men on a basis which might bring hardships and inequities wholly unjustifiable in times of peace. We can perhaps best accept this as the theory and explanation of the acts of 1917 and 1918 without needing to emphasize the thoughts which some of our legislators and officials undoubtedly had and some

vehemently expressed—that there was something in the very nature of corporations which made it fitting that their incomes should be particularly subject to attack and that the seizing upon their incomes and discouragement of activities in corporate form was a particularly praiseworthy effort. Perhaps this was simply an evidence of wartime hysteria and of ignorance of corporate affairs and corporate activities. However, I think we may now count that any such sentiment of prejudice against corporations has passed and can look upon our wartime tax legislation as part of the ill-considered emergency action which always has accompanied, and probably always will accompany, attempts to meet war emergencies. This much of good at least was accomplished—that the study of the corporate tax situation and the attempt to meet it has given rise to a better understanding of what corporations are and how they work and how extensively they form a part of our commercial life.

The 1917 law seems to have been framed having in mind only a comparatively few great corporations and particularly having in mind those which in one way or another had attracted public attention or notoriety. Certain congressmen have since admitted their surprise to find that these were not the typical or average corporations, but that the great majority of all our corporations merely represented groups of individuals who had selected the corporate form as one best adapted for carrying on their business activities. The death blow to the entire excess profits tax theory came with the showing that the highest tax rates were paid by small, rather than large, corporations, and that this was its inevitable result because the small and particularly the inadequately financed corporations were apt to make a far higher rate of return on their capital than would the larger, adequately financed organizations.

If we look at our acts of 1917 and 1918 as purely emergency, wartime legislation, designed to raise money as it could in an emergency be raised, we must admit that they accomplished their purpose, for they did raise stupendous amounts of revenue. However, the principles which they introduced could not, and should not, be considered as precedents for a permanent and peacetime program any more than the draft of men for war is a precedent for a draft of men into the civil service in time of peace.

The Revenue Act of 1917 also brought in the high surtaxes so that the aggregate surtaxes ran from 1 percent at \$5,000 to 63 percent on income of over \$2,000,000. Of course, when there was a possibility of a 65 percent tax on the corporation and a 63 percent surtax on the balance distributed to the stock-

holder, there was little occasion for thought and discussion as to the question of a 2 percent corporate income tax which was not allowed as a deduction to the individual.

The 1918 act raised the corporation income tax rate to 12 percent for 1918 and 10 percent for subsequent years and made the normal tax on individuals 12 percent for 1918 and 8 percent for future years. It also imposed on corporations the war profits and excess profits taxes, which for 1918 might reach 80 percent and for subsequent years 40 percent of the income, and surtaxes on individuals running from 1 percent at \$5,000 to 65 percent on incomes in excess of \$1,000,000. It will be noted that this resulted for 1918 that the individual would have an exemption equal to the entire 12 percent corporation income tax and that for 1919 and subsequent years he could get credit for all but 2 percent of the corporation income tax. We need hardly discuss the stockholder's situation if he were required to pay 65 percent surtax on what remained after a corporation had paid an 80 percent excess profits tax.

The 1918 act for the first time eliminated the attempt to penalize a holding corporation. It fully recognized consolidated returns and fully exempted from the corporation taxes the dividends which a corporation might receive from other corporations who themselves paid these taxes on their incomes.

The 1921 act continued for the year 1921 the 10 percent tax on corporations and the excess profits tax along the lines of the 1918 act, but for 1922 and subsequent years eliminated the excess profits tax and raised the corporation income tax rate to 12½ percent.

The normal tax rate on individuals was continued at 8 percent both for 1918 and for subsequent years. It continued for 1921 surtaxes, running from 1 percent on \$5,000 to 65 percent on incomes in excess of \$1,000,000, but reduced these for 1922 and subsequent years to from 1 percent on \$6,000 to 50 percent on income in excess of \$200,000.

Thus, in 1921 there was still the differential of 2 percent as between the 10 percent corporation income tax and the 8 percent normal tax on the individual. For 1921 the differential became 4½ percent with the increase in the corporation rate to 12½ percent and the continuation of the individual normal tax at 8 percent.

The 1924 act continued the corporation tax at 12½ percent, but reduced the individual normal tax to 6 percent, thus making a 6½ percent discrimination against corporations.

At the same time the 1924 act reduced the surtax rates from 1 percent on \$10,000 to 40 percent for income in excess of \$500,000.



In the above comparisons I have not taken into account the capital stock tax which had been imposed by the 1916 act at 50 cents for each \$1,000 of the fair value of the capital stock; increased by the 1918 act to a dollar on each thousand dollars of value, and continued at this rate until repealed by the 1926 act. As already pointed out, if the value for capital stock tax purposes were fixed at ten times the amount of its income (and these values were often fixed on such a basis) the tax of a dollar a thousand of value would be equivalent to an additional 1 percent tax on the income. It might also be pointed out that there had further been the stamp tax on issues and sales of corporate stock. We may perhaps consider that both the capital stock tax and these stamp taxes represented taxes which it might be said the Government was entitled to collect from corporations because of their existence and activities as corporations, with special privileges accorded to them, but if these taxes are to be so considered there would be that much less reason why any tax should have been collected on corporate incomes for which the individual was not allowed a corresponding credit. As pointed out above, we have been entirely illogical in that regard. Except for those corporations that happened to be subject to an excess profits tax and except where corporations may have been subject to tax on dividends they received from other corporations, we find the following situation as to the corporation income tax for which the individual could not take credit:

	Corporation income tax	Individual normal tax	Corporation tax not allowed to individual
1913-1915 .....	1%	1%	None
1916 .....	2%	2%	None
1917 .....	6%	4%	2%
1918 .....	12%	12%	None
1919-1921 .....	10%	8%	2%
1922-1924 .....	12½%	6%	6½%

The 1926 act eliminated the capital stock tax and increased the corporation tax rate to 13 percent for 1925 and 13½ percent for 1926 and subsequent years. These increases corresponded to the theoretical 1 percent on income, corresponding to one-half year's elimination of the capital stock tax for 1925 and its entire elimination thereafter.

The individual normal tax was reduced to 5 percent. Thus, for 1926 and subsequent years, we have a corporation tax of 13½ percent as compared with a 5 percent individual normal tax, a differential against the corporation of 8½ percent. If we admit that 1 percent of the corporation tax is in lieu of the capital stock tax to represent the tax which the corporation should pay because of its existence as a separate corporation, we still have an unexplained differential of

7½ percent against the corporation. The 1918 act also reduced the surtax rates so that they now run from 1 percent on \$10,000 to 20 percent on income in excess of \$100,000.

In the above summary no attempt has been made to compare the variations in exemptions to individuals nor to take into account that the revenue acts from 1917 on have carried certain reductions in the normal tax applicable to the lower gradations of taxable income; beginning under the 1917 act, with an additional \$2,000 exemption before the additional 2 percent normal tax of that law applied, and continuing until in the 1926 act, we have the rates of 1½ percent on the first \$4,000 of taxable income, 3 percent on the next \$4,000, and 5 percent thereafter. Of course, the man who is subject only to the 1½ percent or 3 percent tax under the 1926 act has, nevertheless, had any income receivable by him as dividends, diminished by the 13½ percent corporation rate, so that the differential against him would be 12 percent or 10½ percent, respectively. No consideration has here been given to the earned income credit which under later acts modifies to some extent these tax rates. Enough complications are introduced by the bare consideration of the stated rates in the several acts.

As already pointed out, we may well recognize that 1 percent of the present corporation income tax rate is logically levied upon the corporation because of its exercise of its powers as a corporation. I think there are many who will have no great disposition to complain of this, although there are others who strongly point out that corporations derive their powers from the states and are by the states subjected to such fees or taxes as the states may consider fully adequate to cover any rights which may be exercised to do business in corporate form. But grant this 1 percent as a fair differential for our Federal Government to impose as against corporations, what explanation is there of the remaining 7½ percent of this differential?

We can not, of course, close our eyes to the fact that individual surtaxes at a rate higher than the rate paid by the corporation has brought about an unavoidable conflict of interest with some tendency on the part of closely held corporations not to distribute their profits to the stockholders. The stockholder is naturally reluctant to pay high individual surtaxes on money which he feels the corporation can invest and reinvest to as great advantage as can the stockholders, while the Government has a fixed determination to compel as far as it can the distribution of such surpluses.

The 1913 act included a provision that the income of the individual subject to surtax should embrace his share of the gains and profits, whether distributed or

not, of corporations "formed or fraudulently availed of for the purpose of preventing the imposition of such tax through the medium of permitting such gains and profits to accumulate instead of being divided or distributed," and it stated the fact that any corporation is "a mere holding company, or that the gains and profits are permitted to accumulate beyond the reasonable needs of the business shall be prima facie evidence of a fraudulent purpose to escape such tax," etc. This provision was wholly ineffective, and later resulted in the provision, such as we have in the 1926 act, to impose a 50 percent tax upon the corporation itself, "If any corporation, however created or organized, is formed or available of for the purpose of preventing the imposition of the surtax upon its shareholders through the medium of permitting its gains and profits to accumulate instead of being divided or distributed." This provision also seems not to have been effective. It undoubtedly has had, and will continue to have, some deterrent effect, but it seems incredible that it ever can be made effective against such a case as that of a resourceful manufacturer who himself, or through his family, owns all the stock of his corporation and can see apparently unlimited opportunities for wholly reasonable and proper expansion of his business activities. While we find strenuously written into law after law some provision of this kind intended to compel the distribution by corporations of their profits, we may well doubt if even those who drafted these provisions seriously believed they would be effective. In any event, we still find that they have clung to the thought that relatively high corporation taxes must be imposed at the same time that the individual's normal tax, from which dividends were exempted, was steadily being reduced. It would, of course, only have been a matter of phraseology of the law to have designated as "normal tax" the entire tax rate payable by the individual up to a rate equal to the tax paid by the corporation. In other words, we could readily have phrased a law to read that the normal tax should be 12½ percent, and then have stated gradations downward to give the same effect as the combined normal tax and surtaxes now give, with the difference, however, that this would have avoided duplication by the taxpayer of the tax which had already been paid by the corporation. Of course, there would be a sentimental objection to making it appear in any way that there had been an increase in normal taxes even though a study of the situation would show that the net results had been more favorable to the taxpayer. The matter might also have been met by amending the dividend credit provisions so that (Continued on page 43)



## WAIVERS, CREDITS AND REFUNDS\*

### *Waiver Practice Of Treasury Department For Purpose Of Extending Period Of Limitation For Tax Assessment Condemned As Inequitable And Open To Serious Abuses—Waiver Provisions Applying Alike To Government And Taxpayer Recommended At Mining Congress Tax Session*

By WALTER A. STAUB†

THE introduction of the income tax in this country as an element in our Federal taxation system, first, in 1909 in the guise of an excise tax on corporations, though, in substance, an income tax, and then in 1913 (after the adoption of the 16th amendment) on individuals as well, created some new problems in taxation methods and procedure. It is true that an income tax was in force during the Civil War period, but this was for the most part beyond the ken of the present generation and the practice and procedure of that time has had little influence on the income tax practice of the present day.

Prior to 1917 the Federal income tax rates were so low<sup>1</sup> that the possibility of additional assessments was not a serious contingency and the limitation of time for such additional assessments did not receive very much consideration. However, the 1909 act did contain a provision for additional assessments, which read as follows:

Fifth. \* \* \* in cases of refusal or neglect to make \* \* \* return and in cases of false or fraudulent return, \* \* \* the Commissioner of Internal Revenue shall, upon the discovery thereof at any time within three years after said return is due, make a return upon information obtained as above provided for, and the assessment made by the Commissioner of Internal Revenue thereon shall be paid by such corporation \* \* \* immediately upon notification of the amount of such assessment. \* \* \*

The 1913 act<sup>2</sup> contained a provision similar to that quoted from the 1909 act. The 1916 and the 1917 acts<sup>3</sup> contained a like provision, excepting that *erroneous* returns were specifically mentioned for the first time as also coming within the scope of additional assessments where the commissioner discovered cause therefor within three years after the return was due or had been made.

The 1918 act<sup>4</sup> extended to five years from the time a return was due or was made the period within which the

commissioner might make additional assessments of tax, and this period was held to apply to returns made under previous acts where the five-year period had not yet expired.

The 1921 act<sup>5</sup> and the 1924 act<sup>6</sup> reduced the period to four years in the case of returns made under those acts,



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but retained the five-year period for additional assessments applying prior to 1921.

The 1926 act<sup>7</sup> reduced the period for additional assessments to three years from the time returns were made for taxable years beginning with 1925. Again, however, the periods specified under previous acts were retained, namely, five years for returns to and including the taxable years 1920, and four years for the taxable years 1921 to 1924, inclusive.

It is clear from the provisions of the successive revenue acts that it was the intention of Congress to set a definite limit of time upon the expiration of which the honest taxpayer might feel satisfied that his income tax liability had once and for all been determined and that if he had paid the amount thereof no further liability could arise therefrom. In fact, the acts of 1909 and 1913 would seem to indicate that, if the

words "false or fraudulent" are to be understood in their usual sense, Congress had in mind that the need for additional assessment would raise only when there had been intent to defraud the Government, or when a return was false through ignorance or palpable error.

Although the Treasury Department inaugurated the examination of income tax returns prior to the war-tax years, business men generally found any additional assessments resulting therefrom more annoying than serious. The amounts were usually not large, so that they caused no serious financial inconvenience to business concerns or individual taxpayers. They were annoying principally because, for the most part, they resulted from an interpretation of the earlier acts which held in effect that such acts were in conflict with good business practice in respect to such matters as reserve for bad debts and the like.

With the advent of the war-tax years, bringing with them unprecedented high tax rates, an entirely new situation arose. Now, if ever, it was important for taxpayers to know as soon as possible their true tax liability so that profits or income which ought to be devoted to the payment of taxes should by no means be distributed in dividends, spent for living or other personal purposes, or invested in fixed assets. This called not only for authoritative determination of the amount of the tax liability, but also for a period of time the expiration of which would give assurance that no further increase of the tax liability could arise, excepting, of course, in those cases where fraud had occurred.

Despite, however, the evident intent of Congress to fix a definite limit of time within which additional assessments might be made, the Treasury initiated the practice of requesting taxpayers to waive the statutory period of limitation on additional assessments. Taxpayers were placed in a quandary by this request. When the waiver practice was first resorted to by the Treasury, there was no provision for the practice in the Revenue Act then in force. The Treasury threatened, however, that, if waivers were not given, immediate assessment would be made of any amounts of additional taxes under consideration by the Treasury or disclosed by the most cursory field audit by a revenue agent or a desk audit in Washington, regardless of how much or how

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<sup>1</sup> The rate for corporations and the normal tax for individuals was only 1 percent prior to 1916 and 2 percent in that year; the maximum surtax rate was only 6 percent prior to 1916 and 13 percent in that year. The maximum rate in 1916 applied only after incomes passed \$2,000,000 in amount.

<sup>2</sup> Subdivision 2, E for individuals and G for corporations.

<sup>3</sup> Section 9 (a) for individuals and section 14 (a) (2) for corporations.

<sup>4</sup> Section 250 (d).

<sup>5</sup> Section 277 (a) (1).

little merit there seemed to be in the proposal of the examiner for additional tax. In a case where depletion had been claimed as a deduction from gross income, or, where a value had been claimed by the taxpayer for intangible assets in computing invested capital, such claims would be disallowed in making such jeopardy assessments. In most cases, taxpayers chose what seemed to be the lesser of two evils. Rather than have additional assessments, sometimes of huge amount, made with the serious effect this might have on the financial position of the taxpayers, they gave the waivers requested and thus extended the period within which the Treasury might either examine or reexamine returns and make additional assessments.

The 1921 Revenue Act<sup>6</sup> for the first time contained a specific provision for the extension of the statutory period of assessment if "both the Commissioner and the taxpayer consent in writing to a later determination, assessment, and collection of the tax." This provision, which has been continued in the succeeding revenue acts, has given the sanction of law to what was originally an extra-legal procedure by the Treasury, and about the legality of which question has at different times been raised, though, so far as the writer knows, no case has been litigated on this point and there has therefore been no authoritative pronouncement by the courts on the question of its legality.

The thought of having one's tax liability an open and undetermined question over a long period of years (there are today still some 1917 and 1918 returns open to additional assessment by reason of waivers having been required by the Commissioner year after year) is foreign to the general conception of the citizen's tax liability. Real estate and personal property taxes are currently determined each year, and after the taxpayer has been notified of his assessment and has paid the amount of the tax, he may consider the obligation discharged and has the practical assurance that no further claims may be expected from that direction. It is true that in the case of corporation franchise taxes imposed by the states, the final determination and settlement of such taxes is sometimes deferred over a period of years, but that has been the case usually where there has been doubt as to the constitutionality of the taxing statute or of the legality of the principle followed by the taxing authorities in determining amount of the tax.

Several reasons might be named for the waiver practice developed by the Treasury. One, that the income tax

was a new form of tax in this country, for the administration of which both Treasury and taxpayers needed experience and, in a sense, training, and considerable time was needed to bring about a settled and expeditious procedure. Another reason was that, particularly during the war years, it was difficult for the Treasury to expand as rapidly as was necessary, its organization of competent, trained examiners and other revenue officials, with consequent inability to complete the examination and final determination of tax liability for a taxpayer within the period prescribed by the statute. Still another reason which might be mentioned is that the Treasury after the enactment of the 1917 excess profits tax undertook the stupendous task of practically valuing all the natural resources and the intangible assets which had been acquired by the corporations of the country for capital stock, or which were affected by the general principle of valuation as at March 1, 1913, for depletion or depreciation purposes.

It is just at this point, however, that a serious inequity has arisen in our Federal income tax practice. Granting, for the sake of discussion, that the Treasury was justified in initiating the waiver practice for the protection of the national revenue, the same argument would apply with equal force to protecting the rights of taxpayers to refunds which would otherwise be barred by statute. The various revenue acts have contained provisions for the refunding of income and profits taxes which had been overpaid, but there has always been a fixed period within which claims for refund or credit must be filed or they could not be made by the Treasury no matter how meritorious the claim or how clear and obvious the overpayment.

The Treasury has taken the position that, as a matter of law, the taxpayer may waive his right of limitation of the period within which any tax on the income of a given year must be assessed, but that the Treasury has no right to extend the statutory period within which claims must be filed by taxpayers in order to permit of refunds or credits being made.

The reasons already mentioned as being among those which might be advanced in justification of the waiver practice apply with equal force to extending the period within which claims for refund or credit might be entertained by the Treasury. A new and highly technical form of taxation had been introduced; the eventual interpretation by the courts of various provisions of the revenue acts was uncertain; at the time returns were made valuations of natural resources or in-

tangible assets acquired years before had to be approximated, or book values were used in the returns which the Treasury revised years later. Under such circumstances justice to the taxpayer calls for just as much consideration as protection of the national revenue. Consequently, there is a serious inequity in our present revenue act when it permits of practically indefinite extension of the period for additional assessments, but makes only a limited extension possible for credits or refunds where the Treasury may eventually determine the tax to have been overpaid.

For example, it has already been stated that the tax liability under all 1917 and 1918 returns has not yet been finally determined by the Treasury. The Treasury has protected the Government by securing waivers in such cases, so that if any additional tax is disclosed upon final determination, it can be assessed and collected. On the other hand, there is no way under the present (1926) act by which claims for refund can now be filed with respect to 1917 and 1918 taxes overpaid under returns filed at that time, excepting in the case of one or two very limited classes of items for which special provision has been made.

Again, the courts have in a number of important respects reversed the Treasury in its interpretation of the provisions of the various revenue acts; in fact, the Treasury has reversed itself time and again on the advice of its counsel. It would certainly seem that when the courts determine that tax has been illegally collected, the taxpayers having paid such tax under compulsion of official regulations, the law ought to make provision for refund regardless of what period of time has elapsed. Consciousness on the part of the taxpayer that he is being fairly dealt with by his country's laws is essential to the maintenance of a proper revenue morale. It is slight consolation to a taxpayer to find that by the time the Supreme Court has passed on a highly complicated provision of an income tax law, under which he was required by the Treasury regulations to overpay his tax, he can not now recover the overpayment because the statutory period within which claim for refund may be filed has expired.

A failure to apply the old adage that "it is a poor rule that does not work both ways" is evident in the position taken by the Treasury in dealing administratively with claims by taxpayers for refund of tax overpaid as compared with the Treasury's position when it is claiming additional tax. The Solicitor of Internal Revenue<sup>7</sup> in Law Opinion 1116 (C. B. III—1, 350) ruled that an item can not be considered as covered by a claim for refund if it is entirely dif-

<sup>6</sup> Section 250 (d).

<sup>7</sup> The present title of the incumbent of the same office is general counsel, Bureau of Internal Revenue.

ferent from those items originally specified in the claim, even though the amount of the claim is sufficient to cover the point if allowed. On the other hand, Treasury Decision 3251, in dealing with claims filed by taxpayers for abatement of taxes assessed against them, states that "an assessment made upon an erroneous theory or by mistake may not be remitted or abated because so made if, at the time its validity is passed upon, the Commissioner is in possession of evidence which shows an equivalent amount of tax." Fairness to the taxpayer requires that if a new item is not to be brought into a claim for refund after the statutory period has expired, the same rule should apply to the Commissioner's action on claims in abatement.

In the interest of equity as between the Government and the taxpayer with respect to additional assessments on the one hand, and refunds and credits on the other, I would suggest the following provisions:

1. That the provision for extending the period of assessment by agreement between Treasury and taxpayer automatically extend the period within which the taxpayer may file claims for refund or credit of tax overpaid for the periods affected by the Commissioner's adjustments under the waiver.

2. That whenever a final court decision reverses a Treasury regulation, in accord with which returns have been required to be made under pain of the penalty for negligence provided in section 275 (a) of the present (1926) revenue act, claims for refund should be permitted, say, within one year from the date of the court decision, regardless of the period which may have run since payment of the tax.

The statutory periods which are specified in the 1926 revenue act for assessment, collection, or recovery of overpayment, of income tax run from a number of different dates. Among them are the following: (a) The period within which assessments may be made runs from the date the return was filed; the periods within which claims for refund or credit may be filed from either; (b) the due date of the return or alternatively; (c) from the date the tax was paid; (d) the period within which taxes may be collected by distraint or by proceeding in court runs from the date the tax was assessed, the period in this case being subject to extension by agreement in writing between the commissioner and the taxpayer; the time within which suit may be begun by taxpayers for refunds runs from either (e) the date the tax was paid, or, alternatively, (f) the rejection by the commissioner of the claim for refund.

All these periods could not be made to run from the same date, but it would be possible by following the suggestions al-

ready made, to simplify somewhat the dates and periods with respect to additional assessments and credits and refunds. At the same time, and this is really the more important consideration, it would bring them into a more harmonious and equitable relation with each other.

## DISCRIMINATION AGAINST INCOME OF CORPORATIONS

(Continued from page 40)

the stockholder would receive in his return a credit against either normal or surtax of an amount equal to the tax paid by the corporation (this amount reduced, if you will, by the 1 percent which it might be considered the corporation properly should pay as additional tax). For our large corporations, with thousands of stockholders, the ordinary stockholder will rarely attempt to measure the effect on what he receives of the tax which the corporation may have had to pay. On the other hand, the Government need not worry as to whether such corporations are attempting to shield their stockholders from the payment of individual surtaxes. A large, clamorous body of stockholders will be more effective than any provisions which can be written into the law to insure that a corporation will distribute all the moneys which it does not need for the proper conduct of its business. We are, in fact, more disturbed by the fear that some such corporations in trying to keep up their dividend records may fail to retain moneys which it would be business prudence for them to conserve instead of distributing.

In the small, closely held corporation, however, stockholders do figure the net result to them of the taxes which the corporation pays them as well as those which they pay themselves. No such stockholder can look with equanimity on being required to pay an additional Federal tax of 7½ percent or 8 percent for the right to do business in corporate form. It inevitably brings a feeling of resentment against a manifest unfairness. Couple this with a threat of an additional 50 percent tax to compel him to pay the higher surtax rates on top of this additional 7½ percent, and he is apt to feel it is a game of technicalities in which he is justified in using every technicality he can find to meet those technicalities which the Government would direct against him.

This is an intensely practical aspect of the situation. The entire success of our income tax as a revenue-producing measure has been in the willingness of the people to pay the taxes imposed, as is shown by the fact that the great bulk of all our income taxes has come in on the first collections by so-called "self-assessment." Only a relatively small part of all the income taxes we have

collected has come from additional assessments made by the Government. This result has come in spite of the confusion and misunderstanding of our laws and in spite of the tremendously high rates which some of these laws have carried.

We can not afford to make this a game of technicalities regardless of fairness and equity. If we are to expect stockholders to pay their taxes in a spirit of fairness, we must have the law meet them in that same fair spirit. I would again repeat that I have no criticism of the reduction of the individual tax rates. Our higher surtax rates are still so high that they should be further reduced in the interest of administrative simplification and efficiency. As has been conclusively shown, the reduction of the higher surtaxes has not necessarily meant a corresponding reduction in revenues. But, perhaps more important, and certainly more necessary to a spirit of fairness to the taxpayers, is the need for elimination, or at least material reduction, in the discrimination which now exists against the corporation. With the existing surplus in revenue, part at least of this might well be met as a reduction in the corporation tax rate. Part could certainly be met on the next revision of the revenue act by a change in the law which would give to stockholders full exemption on corporate dividends, regardless of whether this exemption were represented by a so-called "normal tax" or by a surtax or by such a credit as is now given for other taxes paid at the source.

The mechanism can readily be worked out, and the particular method to be used need not be a subject of great dispute if we clearly recognize the discrimination which now exists and agree that it should be eliminated.

## MARKETING AND PRODUCTION OF COAL

(Continued from page 34)

any men in any other industry. Therefore, I do not like to hear our industry belittled. While I fully realize that we are in a terrible condition, yet I attribute it to overproduction and the fact that coal is very plentiful and so easily obtained, I think the law of supply and demand will prevail until we are able to properly distribute all the coal we can produce.

Detailed requirements covering the construction, dimensions, physical and electrical tests for rubber matting to be used around electrical apparatus or circuits carrying not over 3,000 volts to ground are given in Circular No. 312 of the Bureau of Standards which has just been issued. Copies of this circular may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents each.



# FEDERAL DOMINATION VS. STATE SOVEREIGNTY

*Certain Rules Of Sovereignty Or Constitutional Law Are Elemental—No Great Legal Acumen Necessary To Recognize Them—Our Admiration Has Been Centered On The Design—Wearing Qualities Of The Cloth Proves Original Weavers Knew Their Looms And Chose Materials Wisely*

THE reason and necessity for the formation of the United States of America is aptly stated in the simple language of the Preamble to the Constitution:

"We, the people of the United States, in order to form a more perfect Union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America."

Thus there came into being another sovereign, created by the act of 13 sovereigns. And lest we become lost in the maze of interpretations of that great Constitution, we must hold fast to the understanding that the original 13 states were sovereign in every sense of the word. The debates, and arguments that were had, the speeches that were made, the pamphlets that were published prove absolutely that those original states were not only exceedingly jealous of their sovereign rights but that they had absolutely no intention of making any general grant to the newly created central sovereign.

The new or federal sovereign state was granted certain limited powers, and those powers were set out with meticulous certainty in the Constitution. It was agreed at the beginning that the Federal Government was to be a Government of enumerated and delegated powers only. Unity of purpose and of plan were essential, and therefore it was settled that the powers and privileges to be exercised by the federal sovereign state should be only those laid down in the Constitution. The Federal Government was the representative or mouthpiece of the several states in certain enumerated particulars and this is especially provided for in the tenth amendment:

"The powers not delegated to the United States by the Constitution nor prohibited by it to the states, are reserved to the states respectively, or to the people."

In other words, the Federal Government was then and is now a Government of delegated powers only. It did not then have and has not now the power to arrogate unto itself powers and privileges not enumerated in the Con-

By CHAS. L. GILMORE\*

stitution. There is a maxim of law that is older than the United States, and judges are fond of quoting it from time to time:

"Statutes in derogation of sovereignty are to be strictly construed."

This short line is well to remember, because some of our jurists seemingly forget its existence, particularly when

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*This article is the first of a series of five that have been prepared by the Author upon the question of States Rights with particular reference to the administration of our public land laws. Shall the States or the Federal Government control those public lands which contain minerals? This question has been discussed at the two recent conventions of The American Mining Congress. Mr. Gilmore presents the subject from an entirely different standpoint.—The Editors.*

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dealing with the rights, powers, and privileges of the sovereignty of any of the several states.

## DOCTRINE OF IMPLIED POWERS

After the newly built ship of state was safely launched and the Constitution with its 10 amendments was ratified by the several sovereign states, complications arose. The political party entrusted with the task of steering the ship of state came from the aristocracy. It had battled long and somewhat successfully to avert the formation of a pure democracy on the one hand and a kingdom on the other. If Washington had been one of our modern-day politicians we would have had a kingdom with the Father of our Country the first crowned ruler. But he refused and threw his weight into the work of unscrambling the well-nigh hopeless tangle of governmental affairs.

When these men found that the Constitution prescribed rather narrow limits for the full exercise of power they believed a sovereign should have, they proceeded to find new words and new meanings in that document. Instead of being a Government of delegated powers, as written in the Constitution, it became a Government of unlimited powers, and took over the right to dictate to the

states the limitation upon their own powers. In other words, they established the rule that "Powers not delegated to the states by the Constitution are reserved to the United States."

Thus there came into being the doctrine of "implied powers," first enunciated by Chief Justice John Jay and further amplified by Chief Justice John Marshall, his successor.

Justice Marshall located and enlarged the basis of the theory of "implied powers." He did not put it so naively as Hamilton, who said: "It is convenient and necessary, and therefore constitutional." Justice Marshall, however, based his hypothesis upon the idea that a sovereign should, necessarily, have certain powers, no matter if the Constitution failed to mention them. It was merely an oversight on the part of the original framers of the Constitution, according to his theory, and it was the duty of the courts to provide that necessary element.

The United States Supreme Court readily fell into the way of considering acts of Congress constitutional even though the act admittedly transgressed all limits of congressional authority. While the doctrine was originally a political expediency, erected to encompass certain acts the then leaders thought necessary and convenient to the Federal Government, judges in later years seized upon it as settled law and as having practically no limitation. An illustration of this point may be found by reference to the case entitled "State of Missouri vs. Ray P. Holland," reported in Volume 252, United States Reports, at page 416. This decision states, in effect, that while Congress could not, under the Constitution, assume control of the wild game within a state, it has the power to make a treaty on the subject with a foreign power and then enact the necessary unconstitutional law to make the treaty effective.

In other words, if Congress desires to enact a wholly unconstitutional law in contravention of the very document that gives the Congress the right to exist, it may do by ratifying a treaty on the subject with some foreign power and then enacting a law under the treaty. According to this decision of the Supreme Court of the United States, the highest tribunal in the United States, the Congress is not limited in its treaty or law-making powers by anything contained in the Constitution. If the Supreme Court was and is right in this

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case, then Congress can constitutionally disfranchise people, reestablish slavery, eliminate state governments, abolish the office of President of the United States, grant titles of nobility, prohibit religious freedom, deny right of trial by jury, and many other acts distinctly prohibited by the Constitution. All that is necessary is to make the matter the subject of a treaty with some foreign country.

The far-reaching effect of this new rule of law may not be appreciated by laymen, but to the lawyer the danger is real. It is an entirely new theory of constitutional law, and extends the powers of Congress beyond the wildest dreams of the most ardent bureau propagandist.

#### FORMING NEW STATES

Paragraph 1, of Section 3, of Article IV, of the Constitution, provides:

"New states may be admitted by the Congress into this Union; but no new state shall be formed or erected within the jurisdiction of any other state; nor any state be formed by the junction of two or more states or parts of states, without the consent of the legislatures of the states concerned, as well as of the Congress."

In line with that provision, it was necessary to obtain legislative approval from Virginia in 1863, before West Virginia could be admitted as a state. The proposed state was part of Virginia and she had to give her consent before the new state of West Virginia could be formed. This is stated merely to show that in 1863, even with the pall of Civil War hanging over the country, Congress believed somewhat in the Constitution.

Paragraph 17, of Section 8, of Article I, of the Constitution grants Congress the power:

"To exercise exclusive legislation, in all cases whatsoever, over such district (not exceeding 10 miles square) as may, by cession of particular states, and the acceptance of Congress, become the seat of the Government of the United States, and to exercise like authority over all places purchased by the consent of the legislature of the state in which the same shall be, for the erection of forts, magazines, arsenals, dock-yards, and other needful buildings."

Paragraph 2, of Section 3, of Article IV, of the Constitution further provides:

"The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any claims of

the United States, or of any particular state."

In line with the foregoing provisions of the Constitution, Congress originally started with the idea that the several states were sovereign with respect to the lands within their borders. Congress proceeded to "dispose" of the public lands in the several states and to "make all needful rules and regulations respecting the territory" in so disposing of them.

In October, 1780, Congress resolved that "the lands which may be ceded to the United States by any particular state shall be disposed of for the common benefit of the United States and be settled and formed into distinct republican states, which shall become members of the Federal Union, and have the same rights to sovereignty, freedom, and independence as the other states." The fundamental proposition assented to by the United States upon which these cessions were based, was that the public lands within new states, existing or to be created, should be disposed of, sold, for the benefit of the United States; for the reason that the states believed it would be injurious to their sovereign rights that any large area of land within their borders should be permanently beyond their taxing power and control, and within the sovereign jurisdiction of another power.

To further provide for the theory of "disposal" of the public domain by Congress, every act of Congress admitting a new state into the Union from Ohio in 1803 to February 14, 1912, admitting Arizona, excepting that of Texas on December 29, 1845, has contained a clause similar to the following:

"provided, that the people in said state shall never interfere with the disposal of public lands therein by Congress."

#### THE LAND POLICY DEFINED

For many years, Congress adhered strictly to the rules above set forth, and it was some time before the Supreme Court of the United States was called upon to define the powers of the general Government with respect to the public-land policy. In 1841, a case came before the court (Pollard's Lessee vs. Hagen, 3 How. 212; 11 L. ed. 565), involving the character of title of the United States to public lands within the sovereign states. The Supreme Court declared in that case that as to the Government lands within the states, the United States never held any municipal sovereignty, jurisdiction, or right of soil in and to their territory, or in and to the territory of any of the new states, excepting the right over them of executing the trust, which trust was to provide for their disposition by cessions or

sale. It is further held in that case that every new state comes into the Union upon terms of absolute equality with all other states. Even a layman can readily see that equality cannot exist if in one state the Federal Government exercises sovereign powers over the public lands, while in another it has disposed of such lands, or in the execution of its trust it must dispose of them.

In 1911 we find the same court reiterating the theory of absolute equality of the several states (Coyle vs. Smith, 221 U. S. 559; 55 L. ed. 853), and reasserting the rule laid down in 1841. The court said in the Coyle vs. Smith case that

"This Union' was and is a Union of states, equal in power, dignity, and authority, each competent to exert that residuum of sovereignty not delegated to the United States by the Constitution itself. To maintain otherwise would be to say that the Union, through the power of Congress to admit new states, might come to be a Union of states unequal in power, as including states whose powers were restricted only by the Constitution with others whose powers had been further restricted by an act of Congress accepted as a condition of admission."

The court approved the doctrine enunciated in the case of Pollard's Lessee vs. Hagen in the following language:

"The plain deduction from this case is that when a new state is admitted into the Union, it is so admitted with all of the powers of sovereignty and jurisdiction which pertain to the original states, and that such powers may not be constitutionally diminished, impaired, or shorn away by any conditions, compacts, or stipulations embraced in the act under which the new state came into the Union—."

On December 29, 1845, Texas became, by act of Congress, one of the states of the Union. True, it was "annexed," but the fact remains that it became one of the several states composing the United States. Whether it came into the Union via the annexation route or was just "admitted," as was California, for instance, is beside the question, if the Supreme Court was right in the two cases above referred to. Texas has the same rights, powers, privileges, and prerogatives as the other states; no greater and no less. But the United States never exercised nor did it ever attempt to exercise any sovereignty over the public lands in the state of Texas. That state has, from the beginning, exercised its constitutional sovereignty over all public lands within its borders, and disposed of them under its own laws without regard for or reference to the public-land laws of the United States.

# LEGISLATIVE REVIEW

## *Congress Takes Up National Legislative Program And Manifests A Disposition To Avoid Controversial Issues—Coal Legislation Recommended By President—Muscle Shoals Lease Bill Slated For Further Consideration*

**A**FTER a recess of five months, Congress resumed its legislative deliberations on December 6 for a session which will terminate on March 4 next. Because of the shortness of the session, Congress is manifesting a disposition to act only on matters which involve no serious controversy, deferring mooted questions for the next long session, beginning in December, 1927, when new members of the Seventieth Congress will appear in both House and Senate. Already the Senate has sent back to its Foreign Relations Committee for further consideration a proposed international treaty which would forbid the use of poison gas in war. The treaty aroused considerable opposition from chemical interests, who declared that it would seriously interfere with the development of the chemical industry in times of peace, and that the use of chemicals in war was more humane than some other implements of battle.

Because of changes which are developing in processes for the manufacture of nitrogen, a movement is on foot to refer back to the Senate Agricultural Committee the bill previously recommended by a special congressional commission for the lease of the nitrate and power project at Muscle Shoals, Ala. Representatives of the Senate on this commission advised that, in view of investigations looking toward the use of coal and coke in nitrogen production, it would be better to further consider the Muscle Shoals lease, offers for which have been heretofore based on electrical furnace operations, and Senator McNary, Republican, Oregon, the new chairman of the Senate Agricultural Committee, has given notice that he will move that this proposed legislation be referred back to the committee for further consideration. Another bill which faces a similar fate is the measure for power development in the Colorado River, Senator King, Democrat, Utah, having declared that this project should be further investigated under the direction of the President.

With the postponement of these controversial measures, both the House and Senate are busily engaged in passing on unopposed legislation and are accomplishing much in that direction. The Senate has been considering the bill making appropriations for improvements of rivers and harbors in the interest of navigation, and voted to forbid the diversion of water from Lake Michigan in connection with the proposed improvement of the

Illinois River, in which is involved the controverted question of diversion in connection with the Chicago Sanitary Canal.

Without debate the Senate passed a bill authorizing the lease of unallotted lands in Indian reservations in western states for minerals, not including oil and gas. Another mineral land bill which has made progress is one which has already passed the Senate. This bill conveys title to school-land grants to the states and has been amended by the House Committee on Public Lands to authorize the states to issue prospecting permits and leases to the minerals therein.

Tax-revision legislation has been put over until the December, 1927, session by the action of the House Committee on Ways and Means in declining to consider such legislation at this session. Numerous bills have been introduced to revise the present tax rates downward, including a substantial reduction of the corporation tax. The committee was influenced in its action by the opposition of the President and the Secretary of the Treasury to general tax revision at this time on the ground that the 1926 tax law had not had sufficient time to show in what direction tax revision may be brought about without serious injury to the Government's financial program. The President and Treasury Department recommended the application of present surplus revenues to a percentage reduction in 1927 on 1926 income tax returns, but this idea did not appeal to Congress, as it involved certain difficulties. As a result, the Treasury Department will apply the surplus to reduction of the public debt in the estimated amount of a billion dollars. A joint congressional committee of members of the House Ways and Means Committee and Senate Finance Committee is studying tax revision, and is expected to recommend a program of tax revision legislation during the December, 1927, session.

With the renewal by the President of his recommendation for legislation authorizing mediation of coal strikes and regulation of distribution and prices of coal during an emergency, activity for this legislation has been resumed in Congress. Senator Copeland, Democrat, New York, whose coal-control bill has been on the Senate calendar for almost a year, gave notice that he would seek action by the Senate at an early date. In the House the Committee on Interstate Commerce is considering a bill to carry out the President's suggestions.

First consideration is being given by Congress to the passage of bills making appropriations for the Government services during the year beginning July 1 next. Rapid progress is being made in this direction. Before Congress recessed for the holidays, the House had passed appropriations for four departments—Treasury, Interior, Post Office, and Agriculture. Of these two had also been passed by the Senate. In passing the Treasury bill Congress made no provision for the assay office at Deadwood, S. Dak., and it will be abolished on June 30 next.

Congress expects to take action at this session on legislation to settle claims between Americans and Germans growing out of the seizure of property and other assets during the war. This involves the return of property held by the Alien Property Custodian. The House has passed a bill to carry out this program, and it is expected to receive Senate approval before March 4.

Notwithstanding the near approach of the end of the present Congress, when all legislative proposals will expire with the close of Congress, new bills are being introduced. This is causing considerable activity in committee, action by which is necessary before the measures can be placed before the Senate or House for action. Among the new bills introduced have been the following:

To amend the laws regarding the patenting and location of mineral deposits; to grant public lands to the states; authorizing oil and gas mining leases on unallotted lands in Executive order Indian reservations; creating a waterways and water resources commission; incorporating a world commerce corporation to deal in petroleum and other raw materials; creating regional branches of Interstate Commerce Commission; to repeal the 5½ percent earning guarantee to railroads; amending the law for conservation, production, and exploitation of helium under the Bureau of Mines; for consolidation of railroads; and to investigate the construction of a Nicaraguan Canal.

### MINING CLAIMS

S. 4674. Introduced by Mr. King (Dem., Utah). Referred to the Committee on Public Lands. This bill amends sections 2325 and 2326 of the Revised Statutes to read as follows:

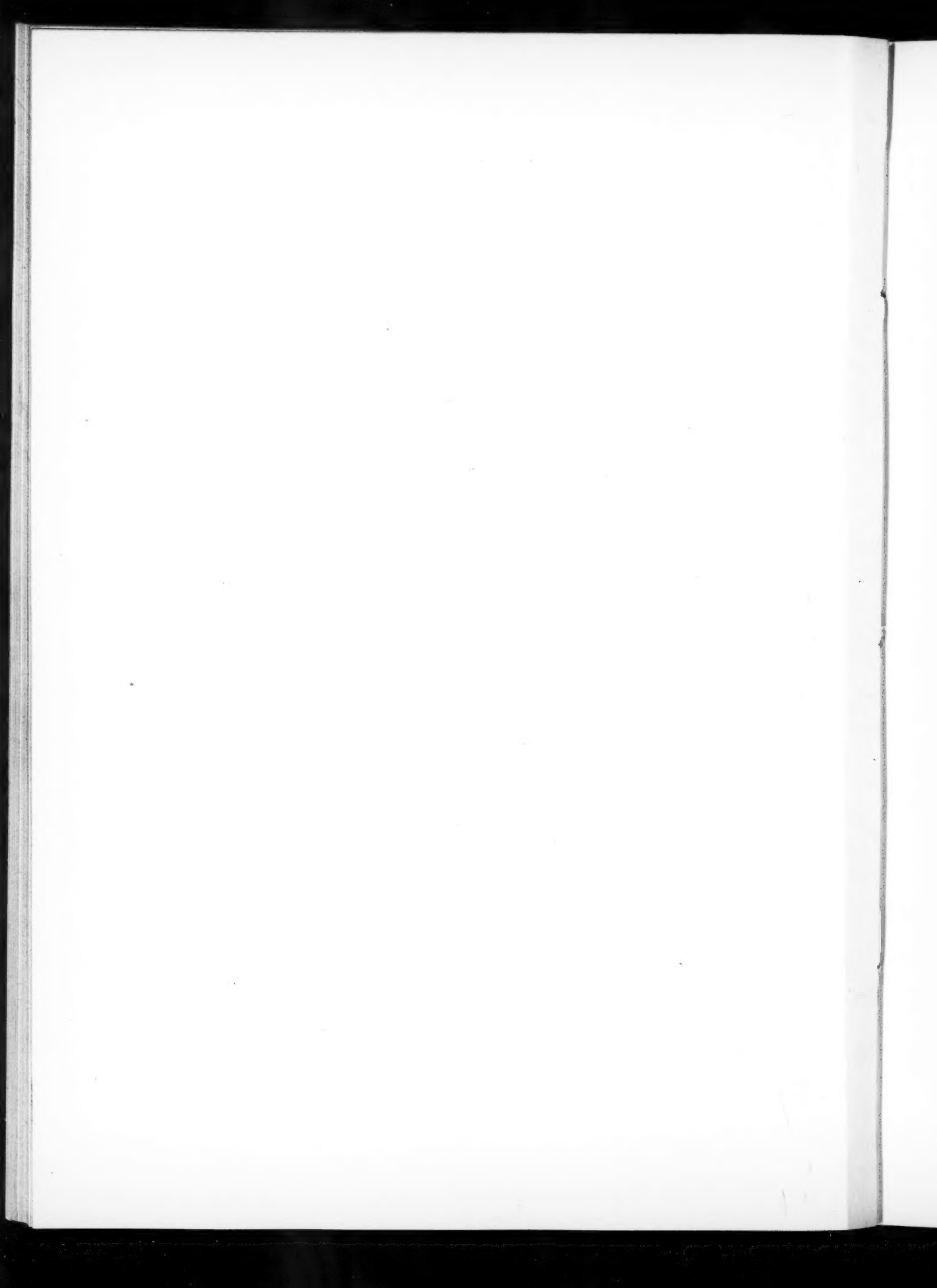
A patent for any land claimed and located for valuable deposits may be obtained in the following manner: Any





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*Our fathers' God to Thee,  
Author of liberty,  
To Thee we sing;  
Long may our land be bright  
With freedom's holy light;  
Protect us by Thy might,  
Great God our king!*



person, association, or corporation authorized to locate a claim under this chapter, having claimed and located a piece of land for such purposes, who has or have complied with the terms of this chapter, shall prepare a statement under oath showing such compliance, together with a plat and field notes of the claim or claims in common made by or under the direction of the United States surveyor general, showing accurately the boundaries of the claim or claims, which shall be distinctly marked by monuments on the ground, together with his application for patent, and shall post a copy of such plat, together with a notice of his application for a patent, in a conspicuous place on the land embraced in such plat and shall thereafter file a copy of such statement, plat, and application for patent, together with an affidavit of at least two persons that such notice has been duly posted, and a copy of the notice in the proper land office, and in a court of competent jurisdiction as and for a complaint or declaration, setting forth that he has located certain claims described in the complaint and set forth in the plat attached to such complaint and has performed all the acts necessary to entitle the claimant to a patent. Service of a summons or order to show cause shall thereupon be made upon the register of the proper land office and upon all persons shown by the records of the land office to have made any entry which may conflict with the said claim or claims and upon all other persons who may be actually claiming possession of said land. The register of the land office upon receiving such summons or order to show cause shall advise the Commissioner of the General Land Office of such service and the commissioner shall thereupon make such answer and take such steps as he may be advised to protect the interests of the United States in such proceedings, and if such lands are not open to entry, or the applicant for patent has not complied with the provisions of law with respect thereto, or there is any other reason why such claimant is not entitled to a patent for such claims, it shall be the duty of the Commissioner of the General Land Office to set up such matters as defenses by answer or pleading on behalf of the United States, denying that such claimant is entitled to a patent as applied for, and it shall be the duty of the commissioner to appear, or be represented, at the trial of said cause in behalf of the United States. Upon the filing of such complaint, claimant shall publish a notice for 60 days that he is applying for a patent for certain mining claims, fully describing the same and giving notice to all persons who may have any adverse claims to present the same by answer or pleading in such proceedings. After the service of summons as aforesaid and after publication of notice as herein provided, and proof of such publication having been filed with the court, and after the applicant shall have filed his affidavits showing that the plat and notice have been posted in a conspicuous place on the land during such period of publication, the court shall appoint a day for the hearing of such proceedings, at which hearing the applicant shall present proof of his compliance with the law relating to the location and improvement of mining claim, that the land is mineral in character and that he has made an actual discovery of mineral thereon, and that he has made improvements to the value of at least \$500 as provided by law, together with any other

## IMPORTANT BILLS REVIEWED IN THIS ISSUE

### Mining

- S. 4674—King (Dem., Utah). Mining Claims.
- H. R. 12393—Passed by House and Senate. Mineral Leases.
- S. 564—Reported by House Committee. School Land Grants.
- S. 4893—Warren (Rep., Wyo.). Oil Leases.
- H. R. 15344—Frothingham (Rep., Mass.). Helium Production.
- S. 4605—King (Dem., Utah). Lands to States.

### Coal

- H. R. 14684—Parker (Rep., N. Y.). Coal Control.

### Taxation

- H. R. 14693—R. G. Fitzgerald (Rep., Ohio). Corporation Tax Reduction.
- H. R. 14576—Garner (Dem., Tex.). Corporation Tax Reduction.
- H. R. 13466—Appleby (Rep., N. J.). Corporation Tax Reduction.
- S. 4843—Shipstead (F. L., Minn.). Credits and Refunds.

### Power Development

- S. 4632—Ernst (Rep., Ky.). Muscle Shoals Lease.
- S. 4627—McNary (Rep., Oreg.). Columbia River. Power.
- S. 4710—Cameron (Rep., Ariz.). Water Resource Development.

### Transportation

- H. R. 15346—O'Connor (Dem., La.). Nicaraguan Canal.
- S. 4892—Fess (Rep., Ohio). Railroad Consolidation.
- S. 4842—Hawes (Dem., Mo.). Regional Commerce Commissions.
- H. R. 14837—Smith (Rep., Idaho). World Commerce Corporation.
- H. R. 15009—Passed by House. Alien Property Return.

facts necessary to entitle the applicant to a patent. If there are adverse claims to possession, the court shall determine the right of possession as between the adverse claimants, and after the United States shall have presented any evidence the Commissioner of the General Land Office shall have deemed proper, bearing upon the right of the applicant to title as against the United States, the court shall make its decision in the premises, which shall be a finding of the necessary facts and a judgment as to whether or not the applicant is entitled to patent. No objection from third parties to the issuance of a patent shall thereafter be heard, except it shall be shown that the applicant has failed to comply with the terms of this chapter.

After such finding and judgment shall have been made, the party entitled to have patent to the claim, or any portion thereof, may without giving further notice, file a certified copy of the judgment roll with the register of the land office, and shall pay to the receiver \$5 per acre for his claim, together with the proper fees, whereupon the whole proceedings and the judgment roll shall be transmitted by the register to the Commissioner of the General Land Office, and a patent shall issue thereon for the claim, or such portion thereof as the applicant shall appear from the decision of the court to rightly possess. If it appears from the decision of the court that several parties are entitled to different portions of the claim, each party may pay for his portion of the claim with the proper fees and file the description by the surveyor general, whereupon the register shall certify the proceedings and the judgment roll to the Commissioner of the General Land Office, as in the preceding case, and patents shall issue to the several parties according to their respective rights. Nothing herein con-

tained shall be construed to prevent the alienation of a title conveyed by a patent for a mining claim to any person whatsoever.

### MINERAL LEASES

H. R. 12393. Passed by the House and Senate. This bill authorizes the lease of unallotted lands in Indian reservations in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Washington or Wyoming for mining gold, silver, copper and other valuable metalliferous and non-metalliferous minerals, not including oil and gas.

S. 4347. Passed by the Senate. This bill authorizes the leasing of unallotted Indian lands for mining non-metalliferous minerals, not including oil and gas.

### MINERAL LANDS

S. 564. Reported by the House Committee on Public Lands. This bill confirms in the states title to lands granted by the Government in aid of schools. The bill authorizes the states to issue prospecting permits and leases for coal and other mineral deposits in the lands. The bill provides:

That, subject to the provisions of subsections (b) and (c) of this section, the United States hereby grants and relinquishes to any State or Territory all right, title, and interest of the United States to the lands, irrespective of their character, granted to such state or territory, by numbered sections or otherwise, for the support of or in aid of common or public schools, or other state institutions or purposes, unless land has been granted to and/or selected by and certified to any such state or territory in



lieu of and/or as indemnity land for any land so granted by numbered sections, or otherwise, and in such case such relinquishment shall be limited to such indemnity or lieu lands.

(b) That the additional grant and relinquishment made by this act are upon the express condition that all sales, grants, deeds, or patents for any of the lands so granted or relinquished shall be subject to and contain a reservation to the state or territory of all the coal and other minerals in the lands so sold, granted, deeded, or patented, together with the right to prospect for, mine, and remove the same. The coal and other mineral deposits in such land shall be subject to lease by the state or territory, as the state or territorial legislature may direct, the proceeds of rentals and royalties therefrom to be utilized for the support of or in aid of the common or public schools or for the attainment of the purposes for which the lands were granted, as the case may be: Provided, That any lands or minerals disposed of contrary to the provisions of this act shall be forfeited to the United States by appropriate proceedings instituted by the Attorney General for that purpose in the United States district court for the district in which the property or some part thereof is located.

(c) That any lands included within any reservation for national purposes, or included in any pending suit or proceeding in the courts of the United States, or subject to the valid adverse claim of third parties, are excluded from the provisions of this act; and lands included within any military, Indian, or other reservation, or specifically reserved for water-power purposes, shall be included within the scope and purposes of this act only from and after the date of the extinguishment of such reservation and the restoration of such land to the public domain.

#### OIL LEASE

S. 4893. Introduced by Mr. Warren (Rep., Wyo.). Referred to the Committee on Indian Affairs. This bill authorizes oil and gas mining leases on unallotted lands in Executive order Indian reservations.

H. R. 15021. Introduced by Mr. Hayden (Dem., Ariz.). Referred to the Committee on Indian Affairs. This is similar to the foregoing.

H. R. 15344. Introduced by Mr. Frothingham (Rep., Mass.). Referred to the Military Committee. This bill amends the act for the conservation, production and exploitation of helium under the Bureau of Mines by placing administration of the act under the Department of Commerce, as, since its passage in March, 1925, the Bureau of Mines has been transferred from the Interior to the Commerce Department. The bill also authorizes the furnishing of helium to aid scientific and commercial development.

S. 4605. Introduced by Mr. King (Dem., Utah). Referred to the Committee on Public Lands. This bill cedes unreserved public lands to the states. The bill would not apply to lands in Alaska.

#### COAL CONTROL

H. R. 14684. Introduced by Mr. Parker (Rep., N. Y.). Referred to the Committee on Interstate Commerce. The title of this bill is to "protect the Government and the public from shortages of coal." It creates the Bureau of Mines as a fact-finding agency for the coal industry; authorizes the President to appoint temporary boards of mediation, and proposes to control the distribution and price of coal in emergencies through the Interstate Commerce Commission and a Federal fuel distributor. The bill provides as follows:

That in order to protect the Government and its agencies, the instrumentalities of interstate or foreign commerce, and the public from shortages of coal, and to have adequate and necessary facts available, in the event of an emergency, for the immediate enactment of such further legislation as Congress may deem advisable and for the proper execution of existing law, the Bureau of Mines, in addition to its other functions, shall ascertain, from existing agencies of the Government (subject to the provisions of law applicable thereto), or by investigations or reports, and shall gather, analyze, compile, and make public from time to time, facts and statistics relating to the number of mines, the number of employees, and the rates of wages, the time worked, the tonnage produced, the methods of marketing and distribution, the consumption, and the stocks and selling prices of coal, appropriate for consideration in the determination of a sound public policy in regard to such industry.

The Secretary of Commerce is authorized to require, by regulation or special order, any person to file with the Bureau of Mines, in such form as the Secretary may prescribe, annual, monthly, or special reports, giving such facts and statistics as the bureau may require in carrying out the provisions of this act. The Secretary may require that such reports be made under oath. Such reports shall be filed with the bureau within such reasonable period as the Secretary may prescribe, unless additional time is granted in any case by the Secretary. Any person who refuses to file any such report in accordance with such regulations or order and in the form and within the time prescribed or granted therefor shall, upon conviction thereof, be punished by a fine of not more than \$5,000 or by imprisonment for not more than one year, or by both such fine and imprisonment. No facts or statistics obtained under this act as to the individual affairs of any person shall be published by the bureau; but only summaries and conclusions, based upon such appropriate industrial and/or geographical classifications as the Secretary may fix.

The Geological Survey of the Department of the Interior, the Bureau of the Census and the Bureau of Foreign and Domestic Commerce of the Department of Commerce, and, upon Executive order, any other department or independent establishment in the executive branch of the Government, shall furnish the Bureau of Mines, from time to time, such information and statistics in its possession as may be necessary to enable the Bureau of Mines to carry out the provisions of this act.

All the records, documents, papers, and

correspondence of the United States Coal Commission, the Federal Fuel Distributor, and the United States Fuel Administration are hereby transferred to the Bureau of Mines.

Any of the information obtained by the Bureau of Mines shall be available to and may be used by the Interstate Commerce Commission in any proceeding under paragraph (15) of section 1 of the Interstate Commerce Act as amended.

The Secretary of Commerce is authorized (a), in accordance with the classification act of 1923, and subject to the provisions of the civil service laws, to appoint and fix the salaries of such officers and employees, and (b) make such expenditures (including expenditures for rent and personal services at the seat of government and elsewhere, law books, periodicals, books of reference, and printing and binding), as may be necessary for carrying out the provisions of this act.

The President, whenever he is of opinion that it is in the public interest and is necessary in order to preserve or restore peace in the coal industry, may (a) direct the Secretary of Labor to conciliate differences, encourage arbitration, or to act as mediator, or (b) appoint and fix the compensation of one or more persons to act as mediators, or (c) establish temporary boards of mediation and appoint and fix the compensation of members thereof.

Upon the designation, appointment, or establishment of a conciliation or mediation agency by the President under this act, he may authorize and direct that such agency shall have for its information access to the records and files of the various executive departments and establishments of the Federal Government showing summaries of profits, conditions in the different districts of the coal industry, the costs of living and such other information as will enable such agency to be informed as to conditions in the industry.

(a) Whenever the President is of opinion that, by reason of a strike resulting in a substantial decrease in the production of coal, an emergency exists which substantially restrains, interrupts, or interferes with interstate or foreign commerce, or which involves imminent threat thereof, he shall by proclamation declare the existence of such emergency.

(b) On the date of such proclamation the provisions of sections 2, 3, 4, 5, and 7 of the act entitled "An act to declare a national emergency to exist in the production, transportation, and distribution of coal and other fuel, granting additional powers to the Interstate Commerce Commission, providing for the appointment of a Federal fuel distributor, providing for the declaration of car-service priorities during the present emergency, and to prevent the sale of fuel at unjust and unreasonably high prices," approved September 22, 1922, shall be revived and become operative and in full effect. As used in such sections the term "emergency" shall be taken to refer to the emergency proclaimed under subdivision (a) of this section, the term "existing" as applied to law or laws shall mean law existing at the time of the making of the proclamation under subdivision (a) of this section, and the term "heretofore" shall mean before the enactment of this act.

(c) Whenever the President is of opinion that the emergency has passed he shall by proclamation declare such

fact and thereupon, except as to prosecutions for offenses, the provisions of the sections revived under subdivision (b) shall no longer be in effect, until the issuance of a proclamation declaring the existence of another emergency in accordance with the provisions of subdivision (a) of this section.

There is hereby authorized to be appropriated such sums as may be necessary for the administration of the functions vested in the Bureau of Mines by this act; and for carrying out the provisions of such act of September 22, 1922.

When used in this act the term "person" means an individual, partnership, corporation, or association. The term "coal" includes anthracite and bituminous coal, and lignite.

This act may be cited as the Coal Emergency Act of 1927.

If any provision of this act is declared unconstitutional or the applicability thereof to any person or circumstance is held invalid, the validity of the remainder of the act and the applicability of such provision to other persons or circumstances shall not be affected thereby.

H. R. 15123. Introduced by Mr. Kendall (Rep., Pa.). Referred to the Committee on Agriculture. This bill was introduced as a protest against the foregoing coal control bill, and is identical in all respects, except that "farm products" appears throughout in place of "coal."

#### LAND ENTRIES

H. R. 15018. Introduced by Mr. Sinnott (Rep., Oreg.) by request of the Interior Department. Referred to the Committee on Public Lands. This bill proposes to validate certain land entries, including the mineral entry of the Pacific Portland Cement Company for the Empire mill site in the Carson City, Nevada, land district.

S. 4865. Introduced by Mr. Stanfield (Rep., Oreg.). Referred to the Committee on Public Lands. This bill, which promotes the use of grazing facilities on national forests, subordinates such use to the development of the mineral and water resources of the forests.

S. 4669. Introduced by Mr. Kendrick (Dem., Wyo.). Referred to the Committee on Public Lands. This bill proposes to cancel a lease of the Kentucky-Wyoming Oil Co., in the Cheyenne, Wyo., land district and to release it from rental payments. The bill says the lease was negotiated prematurely. The company has spent \$100,000 or more in exploration and development work and has paid the Government \$5,000 rentals for which it has received no return.

H. R. 13481. Introduced by Mr. Watres (Rep., Pa.). Reported by the Committee on Public Buildings. This bill authorizes the Government to accept title to land for a post office at Olyphant, Pa., with a reservation of the ores or minerals on the land, with the right of mining them, by the owner.

H. R. 15016. Introduced by Mr.

Brumm (Rep., Pa.). Referred to the Committee on Public Buildings. This is a similar bill, applying to a proposed Federal building site at Tamaqua, Pa.

#### INDIAN INQUIRY

S. Res. 292. Introduced by Mr. Copeland (Dem., N. Y.). Referred to the Committee on Indian Affairs. This bill proposes an investigation by that committee of all matters relating to the administration of the Indian Bureau.

#### CORPORATION TAXES

H. R. 14693. Introduced by Mr. Roy G. Fitzgerald (Rep., Ohio). Referred to the Committee on Ways and Means. This bill fixes the corporation tax at 10 percent for the calendar year 1927 and thereafter.

H. R. 14570. Introduced by Mr. Garner (Dem., Tex.). Referred to the Committee on Ways and Means. This bill fixes the corporation tax at 13 percent for the calendar year 1925, 13½ percent for the calendar year 1926, and 11 percent for each year thereafter.

H. Res. 346. Introduced by Mr. Garrett (Dem., Tenn.). Referred to the Committee on Rules. This resolution provides for the discharge of the Ways and Means Committee from further consideration of H. R. 14570, and for its consideration by the House. The resolution was introduced following action of the Ways and Means Committee in declining to consider tax reduction at this session.

H. R. 13460. Introduced by Mr. Appleby (Rep., N. J.). Referred to the Committee on Ways and Means. This bill proposes to reduce the corporation tax to 10 percent and to repeal the stamp tax, effective January 1, 1927.

#### CREDITS AND REFUNDS

S. 4843. Introduced by Mr. Shipstead (F. L., Minn.). Referred to the Committee on Finance. This bill amends the revenue law covering credits and refunds as follows:

At the end of paragraph 1 of subdivision (b) of section 284, add:

"but if the tax was paid before the date prescribed for its payment, the respective three or four year period shall run not for the time of payment but from the date prescribed for payment."

At the end of paragraph 2 of subdivision (b) of section 284, add:

"except that in case the tax was paid before the date prescribed for its payment, the amount of the credit or refund may equal the portion of the tax, the prescribed date for the payment of which falls within the three or four years, respectively, immediately preceding the filing of the claim, or, if no claim was filed, then within the three or four years, respectively, immediately preceding the allowance of the credit or refund."

#### MUSCLE SHOALS

S. 4632. Introduced by Mr. Ernst (Rep., Ky.) by request. Referred to the Committee on Agriculture. This bill proposes to lease the Muscle Shoals, Ala., nitrate and power project to the Farmers Federated Fertilizer Corporation.

H. R. 14694. Introduced by Mr. Reece (Rep., Tenn.) by request. Referred to the Committee on Military Affairs. This is similar to the foregoing.

S. 4627. Introduced by Mr. McNary (Rep., Oreg.). Referred to the Committee on Irrigation. This bill provides \$45,000,000 for development of water power, navigation, and irrigation in the Umatilla Rapids, Columbia River.

H. R. 13443. Introduced by Mr. Sinnott (Rep., Oreg.). Referred to the Committee on Irrigation. This is similar to the foregoing.

#### LAKE DIVERSION

H. R. 11616. Amendment to, by Mr. Willis (Rep., Ohio), and adopted by the Senate. This amendment forbids the diversion of water from Lake Michigan in connection with the proposal to deepen the channel of the Illinois River.

S. 4710. Introduced by Mr. Cameron (Rep., Ariz.). Referred to the Committee on Commerce. This bill creates a waterways and water resources commission to develop plans for the best use of waterways, including their development for power purposes. The commission would consist of the Secretaries of War, Interior, and Agriculture; a Senator; a member of the House of Representatives; an economist and expert on waterways as they affect industrial development, and a chairman to be appointed by the President. The bill creates a water-control board consisting of the chairman of the commission, three assistant secretaries appointed by the foregoing Cabinet officers, a retired Army engineer officer, and a civil hydraulic and hydroelectric engineer. The commission would coordinate the engineering, scientific, and constructive services of the Government relating to the development of water resources for the conservation of water for industrial and other uses; cooperation of railways and waterways, and promotion of terminal facilities. The commission would report to Congress plans for development of water resources for useful purposes. The bill appropriates \$1,000,000.

Senator Cameron introduced the bill also as an amendment to the pending river and harbor improvement bill.

H. R. 11616. Amendment to, by Mr. Howell (Continued on page 84)



# COMMERCIAL FEASIBILITY OF PRODUCING OIL FROM OIL YIELDING SHALE

*Feasibility Is Entirely Governed By Local Conditions—A Deposit Rich In Oil May, Under Certain Local Conditions, Not Be A Commercial Possibility, While The Eduction Of Oil From Shale, Lean As To Its Oil Contents, May Prove A Very Remunerative Undertaking*

By LOUIS SIMPSON\*

**B**ECAUSE the Scotch deposits of oil shale, on account of present unfavorable local conditions (one of which is the high cost of mining caused by the great depth at which mining has now to be carried on) has become unremunerative, is no reason why deposits of shale, that can be won by the use of labor saving machines, such as are required in open pit mining or in quarrying, should not be remunerative.

The cost of open pit mining and of quarrying also vary according to the local conditions existing, but costs are, in certain cases, so surprisingly low, as to cause the inexperienced critic to doubt their accuracy, especially when such critics are unaware of the advances made on this continent, during late years, in the construction of such machinery. Steam driven shovels have had to give up their once leading position to gasoline engine driven shovels, which, in turn, have been replaced by kerosene oil engine driven shovels, which are now replaced by diesel oil engine driven shovels. Lately where certain special conditions exist, even diesel oil engine shovels are replaced by slicing excavators, operated electrically. In certain cases the electricity required is furnished by diesel oil engines located on the excavator. These latter machines, although expensive in first cost, cost less than any other form of excavator, plus drilling machines, plus explosives, plus the required crushers, all of which are necessary when using any form of shovel excavator. These are all replaced by the slicer excavator with the result that labor and the power costs are greatly reduced. The cost of mining, using these machines under favorable local conditions, is given below. A daily production of 2,000 tons shale would require two machines operating each two shifts. The cost of repairs, depreciation and amortization and of interest are also stated. Depreciation for the total plant including amortization is calculated at 10 percent per year, whilst interest upon the capital expenditure is taken at 7 percent per year. These items vary more or less, being dependent upon many variables. In this case the costs given are based upon conditions known to exist on a certain well known property, when using the Louis Simpson patented retort and systems of condensing and fraction-

ating. The shale retorted is taken as yielding only 20 imperial gallons, or 24 U. S. A. gallons per ton shale.

Power is provided entirely by the employment of diesel oil engines, using fuel oil of own production. The hot water available from the cooling of the several engine cylinders and the heat of the waste gases of combustion being all utilized.

The retorts are also heated by the combustion of by product gas. In the much lauded Scotch practice, coal has been used to generate power and to produce process steam, as much as 100 long tons of coal, per day, being required to operate a works educing the oil from 1,000 tons of shale.

The overburden removal costs per ton shale mined will vary within wide limits, depending not only upon the thickness of the overburden, but also upon the thickness of the shale bed to be excavated. An overburden of 100 feet costs no more per ton shale to remove from a shale bed of 100 feet than does an overburden of 10 feet off a shale bed of 10 feet—usually the larger overburden would cost less.

## COST PER TON SHALE, WITH DAILY PRODUCTION OF 2,000 TONS PER DAY

	Cents
Overburden removal .....	1
Excavating (including fuel oil used).....	6
Conveying to retort (including fuel oil used) 2	
Retorting, condensing and storing.....	5
Total.....	14
Repairs .....	5
Salaries .....	4
Taxes, insurance and sundries.....	2
Depreciation and amortization at 10%.....	20
Interest on outlay at 7%.....	14
Grand total .....	59
Without allowance for interest.....	45

With a yield of 20 imperial gallons of oil, cost per gallon is under 3 cents. With a yield of 24 U. S. A. gallons of oil, cost per gallon is under 2½ cents.

The cost of overburden removal, excavating and conveying is but 9 cents per ton. If 10 per cent is bypassed, the cost would be, say, 10 cents per ton; if 25 percent is bypassed, the cost would be, say, 12 cents per ton; if 50 percent is bypassed, the cost would be, say, 18 cents per ton.

## VARIABILITY OF SHALE OILS

Shale oil is an extremely variable product, the Bureau of Mines points out. It is also extremely complex in composition. By many retorting tests of the principal oil shales of the United States and foreign countries, the Bureau of Mines has demonstrated that identical methods of retorting give different oils

from different oil shales and also that the same shale yields markedly different oils when the conditions of retorting are changed. Apparently, there is no practical method of manipulation of retorting conditions by which shales that differ widely can be made to produce oils having exactly the same properties. Shale oils may contain paraffin hydrocarbons, the proportion of which is largely influenced by the thermal reactions that took place during retorting. However, in most shale oils other types of hydrocarbons and their derivatives predominate. Olefins may be present in large proportions and aromatics in small proportions. Shale oils probably also contain extreme complex compounds. The nature and complexity of these are due to the oil-producing substance in the shale, the amount of undecomposed bitumen present, and the conditions that existed during the destructive distillation.

## STABILIZED MINERAL INDUSTRY

(Continued from page 14)

manufacturing. There are also opportunities for increased profits in the selling of copper, a considerable percentage of which is now being handled by dealers and speculators not financially interested in maintaining prices. Copper should be sold by the producers or their agents direct to the consumer.

While cost reduction methods are always essential and commendable, and while the benefits from increased demand have been important, the copper situation nevertheless continues unsatisfactory.

While some of the mines are making fair returns on the investment, it must be remembered that part of these are in the form of depletion to capital, and in view of this fact and of the depreciated value of the dollar it is doubtful if copper stockholders, as a class, are satisfied with their investments.

The situation can be improved by curtailment and it is the duty of the producer, to his shareholders, to exercise more sincere and forceful efforts toward this end, otherwise copper mining in this country will soon be on the decline.

The limited supply of copper-bearing ores in the United States demands a more liberal and cooperative attitude on the part of the Government to the industry, and more cooperation, confidence and courage within the industry.

\* Consulting engineer, Ottawa, Canada.





# METALS

## PRACTICAL OPERATING MEN'S DEPARTMENT

GUY N. BJORGE, Editor

*Practical Operating Problems of the  
Metal Mining Industry*



### EXPLORATION OF PROSPECTS

*Cost Of Finding Ore Is Score On Which Efficiency Of Running A Prospect Is Rated—Big Items Of Cost Are Labor, Power, Powder And Timber—Necessary Plant, Equipment And Requirements Of Management Outlined*

**A** DISCUSSION of this subject would cover too much territory to treat of all the features connected therewith. The majority of prospects are one or two men affairs, the only machinery in evidence being a windlass and forge. Most mines have started in this way, but in reaching their present status have passed through an intermediate stage at which time they would be considered a small mine with a prospect or development program. At this stage a certain amount of modern machinery with considerable labor takes the place of the handwork done in a small way. It is the intention of this article to deal with prospects, or small mines, requiring the use of air drills and mechanical hoisting.

Naturally, before a mine reaches the condition of requiring power and machinery, it has ear-marks, or showings, warranting the expenditure of money. A certain acreage of ground has been acquired and a very general plan of development outlined.

#### PROSPECTING

It is very important to have all the conditions bearing on the prospect in question well in mind at all times. A fairly accurate geological map of the area under consideration is indispensable, as well as maps showing the underground

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By ROBERT H. DICKSON\*

workings of the area. Intelligent prospecting depends to a large extent in becoming familiar with the conditions under which the ore body is liable to be found by a study of all available data. Any special examination that might cut down development expenses should be considered.

Maps should carefully depict geologic data as near as possible as it exists, and not be drawn according to fanciful ideas of what they should be. Geologic maps of underground workings should be carefully kept up to date, supplemented by notes and assays.

During the development stages, the most important operation is finding and blocking out ore. The man in charge of the work should naturally give this phase a considerable portion of his time. As already outlined he has at his disposal maps and a general knowledge of all conditions.

The old adage "follow your ore" is good advice even in modern prospecting. Scientific geologic work should be commensurate with the probable value of data received. One property started its career by having half a dozen independent reports by eminent geologists, where one would have probably been sufficient. Added to this they sent rock samples for

microscopic examination (at \$25 to \$40 per determination) picked as often as the average operator takes a face sample for assay. Part of this money placed in the ground might have given more information, as geologists can not make ore where nature has not placed it.

Occasionally we lose sight of the fact that often the practical man without a college degree is frequently a good geologist. Some of the old-timers, with years of experience, seem to have a sense of smelling ore.

#### SHAFT

The choice of shaft, or tunnel portal, will depend to a large extent on the following factors: distance to areas to be developed; position of waste dump and ore bins; proximity to surface shops; position with regard to disposal of water from pumping operations; transportation facilities and condition of rock through which opening is driven. A tunnel will obviate hoisting and pumping, but too often will not develop the deposit to the extent a shaft will. A vertical shaft will usually be more satisfactory for operating than an inclined shaft. A three-compartment shaft, the compartments being about 4 to 6 inches by 5 feet, giving two compartments for balanced hoisting and a service compartment for manway, water column, electric cables, etc., has proved very satisfactory. Ordinarily, prospect shafts are not concreted.

The size of shaft timbers with spacing of sets is a matter depending on the condition of the ground, and the nature of the load on the guides. In the West, shaft timbers are usually of Douglas Fir. The timber should be treated with a preservative, except where shaft is wet. Hanger rods and bearing sets, at proper intervals, are indispensable to a good shaft. Where shaft timbers are dry, it is considered good practice to install sprinklers at several points from which the shaft can be sprayed periodically.

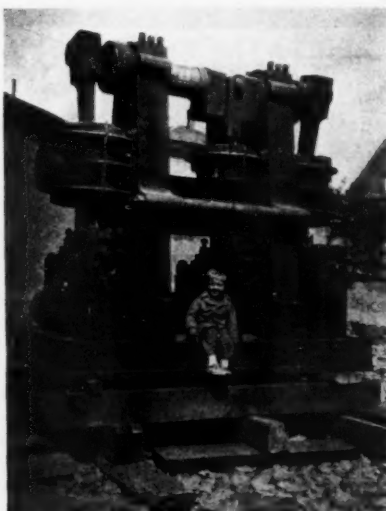
#### HEAD FRAME

The head frame should be of a height to allow margin in hoisting without danger of running cage into sheave. Great care should be exercised in laying the foundations for this structure. The sheave should be as large, or larger, than the engine drum and designed for the size of rope used.

#### POWER PLANT

The location of the mine with reference to transportation, available fuel, water or electric power, will determine the power used.

Under many conditions steam will be



250 Gal. Pump, 85 Mine. Built Up Crankshaft. Water End Bored From Solid Billet

satisfactory, especially where fuel cost will warrant same. Coal, wood, or other available fuel can be used. The Bonney Mine, near Lordsburg, New Mexico, fired

their boilers with dried cacti (Nigger Heads) which were contracted for locally at a very reasonable price.

The general trend in power plants at small mines at the present time is to use the oil engine. The cost per horse power under ordinary conditions will be less than with steam. Two small units will prove more satisfactory from an operating standpoint than one large unit, especially where there is a twenty-four hour demand for power in certain operations, as pumping. It is a good practice to have the necessary starting apparatus for oil engines, as high pressure compressor, etc. A Diesel engine will not ordinarily carry the percentage overload that a steam turbine will. Where the load is intermittent or where there are large hoisting peaks, a steam turbine is often to be preferred.

In buying any mine machinery it is always worth while to consider a type of machine that has been tried out under similar conditions to those under which you expect to operate. Many a dollar has been spent by operators, which could be saved, in perfecting models for machinery companies. The matter of serv-

## INSPECTION PROGRAM. 85 MINE

It is expected that all mine workings are inspected several times during the shift.

I desire that written reports be given the Master Mechanic or Mine Foreman on condition of all hoisting or transporting apparatus.

Following inspection will be made at time specified:

APPARATUS	PART	INSPECTED BY	PERIOD	REMARKS
Skip & Cage	Skip & Cage	Blacksmith	Daily	Thorough examination of skip, cage and fastenings.
Skip & Cage	Dumps	Blacksmith	Daily	Examine by watching skip of ore dump.
Skip & Cage	Dogs	Blacksmith	Weekly	Block skip and see if dogs hold.
Sheaves	Liner, Sheave, and Bearings	Mechanic	Daily	Look for loose bolts, cable rubbing on sheave bar, marks on line.
Cable	Hoisting cable	Master Mechanic	Weekly	Examination for kinks, broken wires and reduction of area.
Guides	Shaft Guides	Mine Foreman	Weekly	Examination from bonnet protruding lag bolts.
Shaft Timbers	Shaft Timbers	Mine Foreman	Weekly	Condition of timbering.
Pockets	Cartridge	Mine Foreman	Weekly	Condition of chute gates. Obviate spillage in shaft.
Bell Cord	Rope	Mine Foreman	Weekly	Try out at various levels.
Haulage Tunnel	Track & Roof	Mine Foreman	Weekly	Faulty track; bad back.
Hoist	Hoist	Machinist	Daily	Brakes, clutch, etc.
	Switchboard	Electrician	Daily	Contacts, coils, etc.
	Motor	Electrician	Weekly	General.
	Pump Motors	Electrician	Weekly	General.
Pumps	Pumps	Pump Repairman	Daily	Action valves. General insp. pump.
Ore Bins	Machinery	Carpenter	Weekly	Belt, bearings, etc. Motors.

.....Supt.

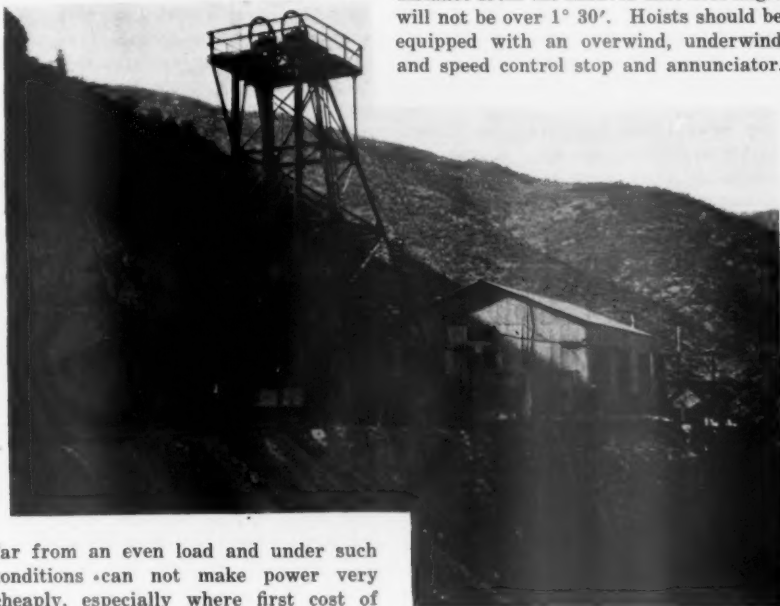
Inspection Program at one of the mines of the Verde Central Mines

ice and obtaining spare parts warrants a careful consideration.

Where possible, and when the power rates are reasonable, it is often economy to purchase electric power from a central company. The usual prospect has

the starting torque that a conical drum, or reel with flat rope, provide, but have other advantages. Small hoists are equipped with band brakes, but for heavier duty post brakes are preferable.

The hoist should be placed at such a distance from the sheaves that fleet angle will not be over  $1^{\circ} 30'$ . Hoists should be equipped with an overwind, underwind and speed control stop and annunciator.



Head Frame, Verde Central Mine,  
Jerome

far from an even load and under such conditions can not make power very cheaply, especially where first cost of plant is considered.

#### HOIST

Hoisting is usually a very essential feature of any mining operation. Steam hoists are very flexible and simple to operate, and under certain conditions are most economical to operate today. Gas engine hoists are favorites on small installations.

The majority of hoists in small mines are electrically operated, usually geared to an induction motor or to a direct current motor. The induction motor type is almost universally used in small and medium sizes. It is economical of power use, but where high power peaks are penalized, or prohibited, its use is not advisable.

Direct current motors direct connected, or geared, to the drum are used on large sized hoists, and those where it is desirable of maintaining an even load. Generally, alternating current power is supplied to a motor generator set, with or without a flywheel in series, which supplies power to the direct current motor. By proper controls, an even amount of power is drawn from the line, thus obviating the peaks. One disadvantage of this type is that the motor generator set and flywheel absorb energy whether the hoist is working or not. Where the hoist is not working continuously, this waste of power is considerable.

Cylindrical drums, grooved where there is more than one wrap, are generally the favorite. These drums do not provide

#### ROPE

Hoisting rope is made in various sizes of different construction, material and lay. The best grade of hoisting rope obtainable is usually the cheapest. The ordinary 6 x 19 regular lay of best steel is about as satisfactory as any where chairs are used. Wire rope, like any other machinery, lasts longer and operates better, when properly lubricated. Hoisting cable should be cut as advisable at the bottom end (where wear is probably most severe) and at the drum end (to change portion of rope at the overlap).

#### SIGNAL SYSTEM

The manual bell cord in the shaft provides for signals from all parts of the shaft. Electric pull, or push, switches for operation of the cage will save time and often speed up hoisting operations. A call system whereby any station can advise the cager, or engineer, of its wants is very desirable. Underground telephones are often a necessary convenience. It is a good plan to have all signal wires confined to one cable in the shaft.

#### COMPRESSOR

The smaller size single unit oil engine driven compressor is widely used due to its low cost of operation. On a par with this is the electric driven single stage, double acting straight line compressor. For intermediate size compressor the two

stage with partial, or full unloading device is probably one generally used. A compressor should have sufficient air receiver capacity. It is important that compressor be supplied with correct kind of lubricating oil. Another important matter is to keep the receiver free from oil and water.

#### PUMPS

Handling water is often one of the major operations from a cost standpoint of many prospects. Water, especially when pumping equipment is a little shy, can cause a mine operator considerable worry.

Air, steam and electric driven pumps are in use; the latter predominating. Air driven pumps are very wasteful of power and only used in shaft work.

Plunger pumps are the most economical where the quantity of water is relatively small and the head relatively large.

Multi-centrifugal pumps are less efficient, but initial cost is less, making them a desirable standby to be operated in emergencies. For low heads and large volume a centrifugal pump is desirable.

Formerly water in deep mines was handled in several lifts. Plunger pumps are now in use throwing water up to 2,000 feet in one lift. The "85" Mine at Lordsburg, N. Mex., is equipped with two 250-gallon Worthington Pumps, handling water in 1,650-ft. lift and capable of 2,000 feet. A feature of these pumps is the water end bored out of a solid forged billet and a built-up crank shaft.

As the pressure increases on a plunger pump, the material of which the valve facings are made becomes very important. Rubber, Micarta, Egyptian Fibre and Balata are used for this purpose. With water containing no grit a brass valve facing is very satisfactory. Intelligent operators and a clean convenient pump station contribute greatly to an economical pumping cost.

#### SHOP EQUIPMENT

The average shop for a small mine usually contains only enough equipment to sharpen drill steel and make the small necessary repairs.

As drilling is one of the most important details of mining the condition of drills and drill steel requires careful attention. I have found it to be good practice to have a drill repair specialist rather than to delegate this work to the blacksmith, or other mechanic, as is commonly done in the smaller mines. To obtain results the miner must have good steel, especially in harder ground. The bits should be carefully formed and tempered. The face of the shank should be of the proper shape, not chipped, and of the proper hardness. Where oil is used for tempering, a circulating system in water helps keep the oil at the proper



temperature. A drill shop essentially consists of a furnace, usually fired by oil; a sharpener, with punch attached; water and oil bath for tempering and racks for holding the steel. The shop should be arranged to minimize the handling.

Important tools for the small operator are the Oxy-Acetylene torch, which can be used for welding and cutting, a drill press, pipe machine and small lathe. I am of the impression that the Oxy-Acetylene torch is probably the handiest tool in the shop.

#### UNDERGROUND EQUIPMENT

This equipment will consist of cages, cars, drilling machines, etc. During the development stage cages are usually more convenient than skips. The various standardization bulletins of the American Mining Congress contain very valuable data on standards for underground equipment. I have found 18-in. gauge track on a one-half of 1 percent grade with 16-cu. ft. roller bearing cars very satisfactory for hand tramping.

The type of drilling machine will vary with the ground and labor available. It is poor economy to keep in operation a worn-out drill, or drill not heavy enough for the ground. The labor and power saved by a new or heavier machine will pay for the machine in a short time. It is good policy to use the lightest machine that can do the work economically. Careful attention to lubrication will decrease upkeep costs. The Verde Central Mine is using oil line lubricators on their drifting and raising (stoper) machines with good results.

#### MANAGEMENT

The man in charge of a small mine is usually confronted with a wide range of problems, which he must solve for himself. As the amount of machinery used increases, the possibility of a break-down tying up operations also increases. For small mine conditions, I believe that inspections per schedule of machinery aid keeping everything in first class shape. The schedule definitely places the responsibility. Attached is the Inspection Schedule as used at the 85 Mine, Lordsburg, N. Mex.

A small mine operates under slightly different conditions from a larger one. In small and developing mines, the crew is limited, therefore every man must be in his place for the crew to work smoothly and efficiently. When the drill runner is off, this leaves nothing useful for muckers following to do, yet the muckers must be kept on the payroll. Small plant operations often have not the tools or equipment of the larger ones; therefore a good motto to follow is do the best you can with the labor and equipment at hand, especially when one can not help himself.

The cost of finding ore is the score on which the efficiency of running a pros-

pect is rated. Among the big items of cost are labor, power, powder and timber. Everyone on the job should be impressed with the idea of cutting these costs. Among the things to be watched are: never have two men do one man's work; have machines rather than men do the work where possible; give a man good air and good tools to expect results; watch the air leaks; hoist in balance where possible; bear in mind that a stick of powder saved here and there soon make a box; standardize on fitting, machines, drill rounds, etc. A man will usually do more work where he works mechanically, or in work with which he is familiar, than by giving him new and strange conditions to face.

The man in charge of a small mine, or prospect, is the personal representative of his company and as such has certain civic obligations. The townspeople should be impressed with the importance of the mine as an asset to the community. As the estimation in which a company is held by the community is usually a reflection of their employees' attitude, it pays to treat employees squarely and courteously, with the idea of making them boosters.

#### STATE OF GOLD INDUSTRY

(Continued from page 20)

it is a vicious growth from which the Government should want to free itself.

It has been suggested that a co-operative selling organization could be formed and financed by the larger producers of gold. That on proper representations the Government could be brought to abandon its policy of fabricating and selling gold bars to the manufacturer. That the first function of this organization would be to purchase all newly produced gold at \$20.67 per ounce. That its other function would be to refine and prepare this gold for the fabricator to whom it would be sold at a price sufficiently above the original purchase price to provide for the amortization of the assaying plants and cover all fixed charges in connection with their operation, plus an amount per ounce sufficient to bring the price of gold up to where the operators of the vast proportion of gold mines, could make a profit. At quarterly periods, or more frequently, after charges were determined, the producers could be paid their bonus.

To accomplish this, it would be necessary to eliminate the Government as a seller of fabricated gold and to secure the passage of more stringent clauses regulating the destruction of coinage and to supervise the delivery of foreign gold in this country.

It is easy to anticipate the possibilities of fraud in dealing with this selling agency. But there are ways of circumventing fraud. In the Denver Mint, for instance, when Mr. Grant was there and

since then, the gold which came in had to have a pretty clean "bill of health." We still have in the Cripple Creek district, a Mine Owners' Association. Today, most of its efforts are directed toward the elimination of "high grading" and I can assure you from my experience with that Association, that with proper observation of the source of supply of the manufacturing jewelers, which would be possible, the opportunity to secure any serious supply of gold, would be small indeed. Gold is difficult material to handle or dispose of in quantity. We had an illustration of this in our Association a year or two ago, when we were notified by the Canadian Mint, that a bar of gold received there corresponded to an assay we had sent them. Our operative was sent on, and, as a result of his efforts, the United States Government was able to bring to justice a band of mail robbers that had been at large for over a year. So I insist that the danger from the crook or "gold bootlegger" could be eliminated to a degree and what gold did get by, would not result in loss, for the marketing organization would be "out" only the operating expense, on the gold furnished it from this irregular source.

It seems to me that this suggestion merits some further consideration. All our plans for the saving of this industry up to date have failed. But there is generally a way out of any maze and I feel that this organization, in possession, as it is, of full and detailed information on this very vital subject, should leave no stone unturned in its efforts to find a solution of this problem.

#### USES OF GRAPHITE

Natural graphite is used chiefly in the manufacture of foundry facings, pigments and paints, crucibles, pencils and crayons, and commutator brushes, states the Bureau of Mines, in a recently issued report. As the result of an investigation by the United States Tariff Commission, it was found that, contrary to general opinion, the use of graphite in the manufacture of crucibles is comparatively small. Only 15 percent of the consumption for finished products went to this use in 1923 and 13 percent in 1924. Foundry facings consumed the largest proportion—44 percent in 1923 and 52 percent in 1924. Pigments and paints were second in the quantity of graphite consumed—16 percent in 1923 and 18 percent in 1924. The manufacturers of pencils and crayons and of commutator brushes ranked fourth and fifth as consumers of graphite, each taking 9 percent in 1923 and 5 percent in 1924. Only three uses, all minor, showed increases in 1924 as compared with 1923. Graphite for bearings and bushings and for lubricants commands the highest prices.

# OPERATING A DRILL STEEL SHOP ON A FACTORY BASIS

*Economy Through Standardization And Centralization — Advantages Of System Outlined Include Flexibility Of Operation, Decrease In Drill Steel Required, Reduction In Wastage, And Increased Rock Penetration*

By GEORGE J. STEIN\*

THE history of the development of the average mine in most mining districts will disclose a perfectly logical sequence of steps—its discovery as a prospect; its "opening up" on a small scale, and its gradual development into an undertaking of respectable proportions.

In like manner the several service units, such as air plant, steel shop, and general repair shop have their beginnings in the natural course of things, as small plants, increasing in size and facilities with the increase of the mine size and its needs. Throughout, however, there exists a note of centralized service facilities.

At times, adjacent individually operated mines will come under a common ownership and even here in most districts the practice has been to bring them under the service of centralized plants, although continuing to operate to some extent with a more or less individualized personnel in all other respects.

Individually operated adjacent mines having a common ownership but with separate plant facilities as well as personnel, are the exception rather than the rule. More particularly is this true of small acreage properties.

In practically all mining districts the topography is of rugged character and haulage of ore, supplies, steel, and what-not is usually encompassed through underground channels by way of a number of shafts and haulage tunnels serving rather extensive workings.

In the Oklahoma-Kansas-Missouri district the very formation of the mineralized zone, the depth of the mineral from the surface, its extent, etc., is such as to make it economically advisable to depart from the more or less accepted practices and operate a series of small mine units, representing in fact separate entities even when under a common ownership.

Each mine will have its individual mill, compressor plant, steel shop, and other facilities.

Obviously this has made for a multiplicity of practices among even the group, single-ownership mines, difficult to control because dependent so largely upon the human equation. Especially is this true of the steel shop and it is quite the usual thing to find that a company owning five or six or possibly more mines and maintaining an equivalent

number of steel shops will be using different shapes and gauges of bits and different steel changes—and the bits will be differently heat treated at each plant. Such practice makes for a greater investment in equipment and multiplies the plant maintenance and supervision, and results in a variable efficiency.

The Commerce Mining and Royalty Company, operating at times from 12 to 14 mines, had for some time been studying the situation with a view to the possibility of securing a uniformity of practice and equipment, hoping thereby, not only to accomplish an increase in efficiency through improved practices, but in addition to effect greater economy through standardization and centralization.

It looked upon the problem much from the viewpoint of a manufacturer of a commodity—first, a single shop designed to do a given thing efficiently and expeditiously; secondly, a shop of sufficient size to take care of a more or less definitely known maximum volume of orders; thirdly, a shop designed on a unit basis and having a sufficient flexibility of operation to simplify curtailment of production when its business, or orders, fell off, and to do it economically.

Naturally, in considering the problem there immediately arose a number of questions having a vital influence on the major plan, if the ultimate success was to be attained.

This necessitated a study of the drilling conditions to determine:

(a) The shape of drill bit to meet most advantageously the varying character of the ground in this district.

(b) The proper variation in gauge diameter of the drill bit for the different lengths of drill steel.

(c) The most advantageous sizes and sections of hollow rock drill steel consistent with the conditions.

(d) The most advantageous type of drill steel shank.

(e) The permissible change length of drill steel.

As a result of this analysis, it was decided to standardize upon two sizes of round section hollow drill steel, 1 inch and 1½ inches diameter, both having the standard lugged shank for adapting the steel to the bayonet lock type of drill chuck employed by the light and heavy

drifters with which the mines are equipped. For the heavy drifter rock drill, 1½-inch round hollow drill steel is used for drilling holes to a maximum of 20 feet, in 30-inch change lengths, and the lighter type of one-man drifter employs 1-inch round hollow steel for drilling to a maximum depth of 14 feet, in 24-inch change lengths.

A cross bit having a cutting edge angle of 90 degrees with a true reaming edge clearance angle of 7 degrees, backed up by a 14-degree wing angle, was determined to be best suited to the rock conditions in the field for both sizes of drill steel, and the gauge decrement or the variation in gauge diameter of the drill bit for the different change lengths of steel as 3/32 inch. The mouth diameter of the holes drilled with the 1½-inch steel is 2½ inches and that of the 1-inch steel is 1 15/16 inches, which with the 3/32-inch gauge variation provides for a bottoming size of sufficient size to accommodate the employment of blasting cartridges 1¼ inches in diameter at the required depth of both sizes of drill hole.

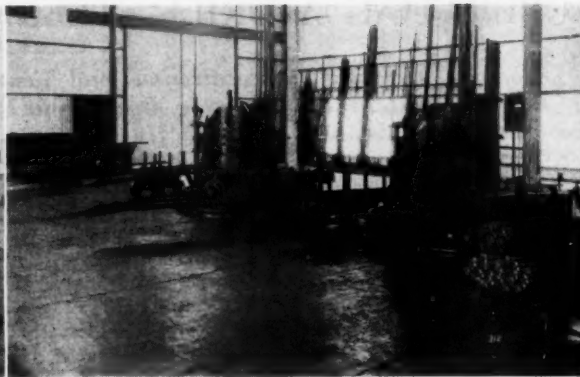
Along with the study, efforts were directed toward securing, if possible, a better drill steel than that being employed. Great care was exercised in the selection of this steel and the decision to adopt as standard at all mines a European product known as Gilman Serpent Steel was reached only as a result of trials which extended over a period of 18 months. It possesses qualities that afford maximum resistance to vibratory shock and abrasion. By virtue of its chemical properties, this steel will withstand the effect of high forging temperatures with but a slight increase in grain size, and its critical temperature (the temperature at which it should be quenched for hardening) extends throughout a much greater temperature range than the ordinary hollow drill steels at present on the market.

With these determinations completed, the next step was to determine how best to insure the results sought.

This led to an investigation of facilities for doing the work, to standardize if possible the shop practice to such a point as to make for a constant production of a uniformly identical product, just as a manufacturing plant might use a battery of automatic production lathes to make the same piece over and over again.

It was realized that in anything that

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Central Drill Steel Shop of Commerce Mining and Royalty Company, Cardin, Okla. This shop supersedes 12 independent drill steel shops, each of which contained a complete sharpening unit and employed from two to four men each. This centralized drill steel shop is now manned by a superintendent and 14 men. The mechanical equipment consists of four drill steel bit forging units, one drill shanking unit, one heat treating unit for the bits, and one inspection unit.

Steels up to 22 feet long are provided daily to maintain more than 150 rock drills in constant operation.

This view shows the monitor of roof for ventilation, and elevated fuel oil tank whereby 12 pounds oil pressure is secured by gravity.

Central Drill Steel Shop of Commerce Mining and Royalty Company, Cardin, Okla. Close-up view of heat treating machines, inspection unit and finished drill steel storage racks.

Each automatic heat treating machine is a self-contained rotary unit comprising an oil-fired furnace of the semi-muffled type, quenching tank, electric motor and mechanism for transporting the drill steel from the loading table to its point of ejection. In passing through the machine, each bit is automatically heated, hardened and tempered.

At the rear of the heat treating machines is located an inspection bench and cupboard for the inspection gauges, including go and no-go ring gauges for each size of bit and shank, pin gauges for hole in bit and shank ends of steel, and compressed air blow gun.

might be done the human element would still play a part in the operation of the various tools necessary for the work, but just as the foreman in a department of automatic production lathes is enabled to control the product, so in the Commerce shop it was sought to use automatic tools (supervised by a single foreman) wherever obtainable and largely eliminate thereby the human equation.

Again to maintain the standard shape of drill bit and shank, throughout as great a penetration as possible without undue wear or breakage, and incidentally to reduce to a minimum the number of pieces of drill steel required for the work, a standardized system of procedure has been established for forging both the bit and shank ends, and a standardized method has been adopted for its heat treatment, prior to the time at which the individual steels are inspected and placed in the finished drill steel storage racks, from which they are transferred to the different mines by two Chevrolet trucks of one-ton capacity.

Having a definite knowledge of the peak requirements in number of pieces of drill steel, it became only necessary to approximate possible future increasing requirements, giving due consideration to the anticipated saving in number of pieces of drill steel which should result from standardized and increased efficiency of the drill bit, to decide the size of plant to install.

The plant as finally decided upon and built has a maximum capacity over an 8-hour shift of 1,200 properly formed and heat-treated drill steels (varying

in length from 30 inches to 20 feet) when manned by 12 men.

#### EQUIPMENT OF THE PLANT

The mechanical equipment of the drill-steel shop decided upon consists of four drill-steel bit-forging units, one drill-shanking unit, one heat-treating unit for the bit end of the steel, and one inspection unit. Each of the forging units consists of:

One dull drill-steel rack.

One Gilman CB5 semi-muffled type of forging furnace, equipped with automatic-control pyrometer.

One Sullivan Class A drill sharpener, with air actuated punch and Gilman limit gauge.

Two ball-bearing roving trucks.

The equipment of the drill-shanking unit, in addition to the foregoing, consists of:

One Gilman oil-quenching vat, with removable false bottom composed of a round wire screen, the whole being surrounded by a tank in which cooling water is caused to circulate.

One United States electrical floor grinder, with two grinding wheels, 18 inches in diameter by 3-inch face width.

The equipment of the heat treating unit consists of:

Two Gilman CE21 automatic heat-treating machines, each equipped with a Brown automatic-control pyrometer.

The equipment of the inspection unit consists of:

One inspection rack, with limit gauges.

A fuel oil of 28-32 Baume is delivered to the burners of all forging furnaces and to the furnaces of the automatic

heat treating machines at a constant pressure of 12 pounds, secured by gravity flow from an elevated tank of 1,000 gallons capacity, adjacent to the drill-steel shop; and blower air at a pressure of 10 ounces is delivered to the burner of each furnace from a Sturtevant steel pressure type blower, driven by a 7½-horsepower Westinghouse electric motor.

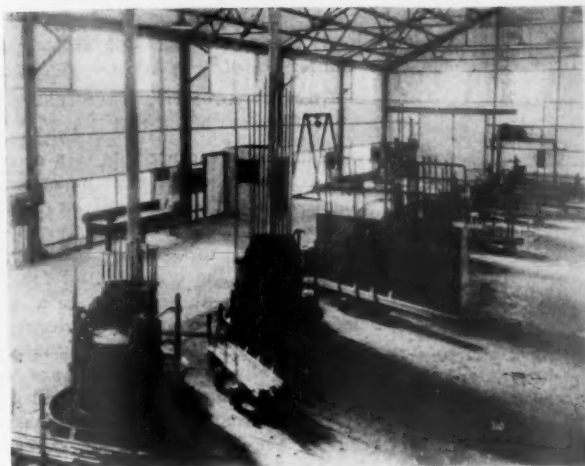
In the design of the plant and location of the equipment the matter was considered from the standpoint of procuring a natural flow of the product through the plant, thereby minimizing the effort and time.

To this end a passageway for the automobile trucks extends throughout the entire length of the building directly at the rear of the sharpening machines and the heat-treating units, in order that the dull drill steel immediately upon its removal from the truck may be classified as to length and size, and placed in the proper dull drill-steel forging rack.

The floor of the entire shop is of concrete, all of which, excepting the passageway for the truck, is covered with steel plate, and relative location of the various mechanical units is such that the internal transportation of the material is accomplished most advantageously by the means of roving trucks equipped with ball-bearings.

A sub-floor conduit extending longitudinally throughout the building directly rearward of the drill-sharpening machines, and having branches which lead to the various mechanical units, provides space for the air, oil, and electric piping.



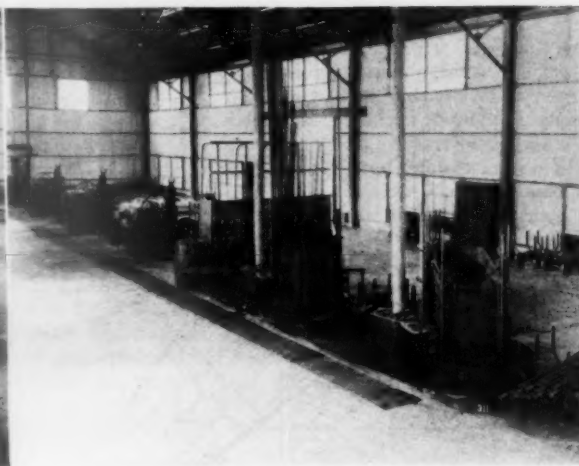


Central Drill Steel Shop of Commerce Mining and Royalty Company, Cardin, Okla. Interior showing front view of heat treating machines, forging furnaces, sharpeners and oil quenching tank for shanks.

A blower, having a capacity of 1,200 feet of free air per minute, supplies a constant pressure of 10 ounces at each burner.

An oil quenching vat, with removable false bottom, is inserted in a larger tank containing cold running water.

Note the automatic control instruments for the furnaces and heat treating machines on the left wall, also the port-



able crane for removing heads from heat treating machines and arches from forging furnaces.

Cupboard at rear left corner stores all dollies, dies and sharpener equipment.

The picture to the right shows heat treating machines, sharpeners, forging furnaces, oil quenching tank and emery wheels and the automatic control mechanism attached to all furnaces.

A United States Electrical Floor Grinder is equipped with two grinding wheels, 18" diameter by 3" face width.

Note the sub-floor conduit at the rear of machines, which contains all air, oil and electric piping for each unit.

#### DESCRIPTION OF HEATING UNITS

These are the products of the Gilman Manufacturing Company and because of their departure from apparatus heretofore offered for such work, and because of the novel features they incorporate, a brief description may prove of interest.

The two outstanding features of the Gilman CB5 forging furnace are:

(a) It does not oxidize nor decarburize the cutting end of the drill steel regardless of how long it is subjected to the maximum forging temperature of the heating chamber.

(b) The temperature of the heating chamber is maintained constant by means of an automatic-control pyrometer.

It is a known fact that when a used or dull drill bit is heated to a temperature in excess of that known as the safe forging temperature (in practice, 1900-1950 degrees F.), the structural grains of the steel increase in size and if this heating is done in an oxidizing atmosphere, the carbon in the drill bit is attacked and passes off as a gas, leaving a film of iron of varying depth over the entire surface of the bit. When in this condition, the common practice is to subject the bit to a dollying action in order to properly shape the cutting end. This dollying or hammering action displaces the decarburized film and throws it to the extremities of the wings of the drill bit, which have previously been

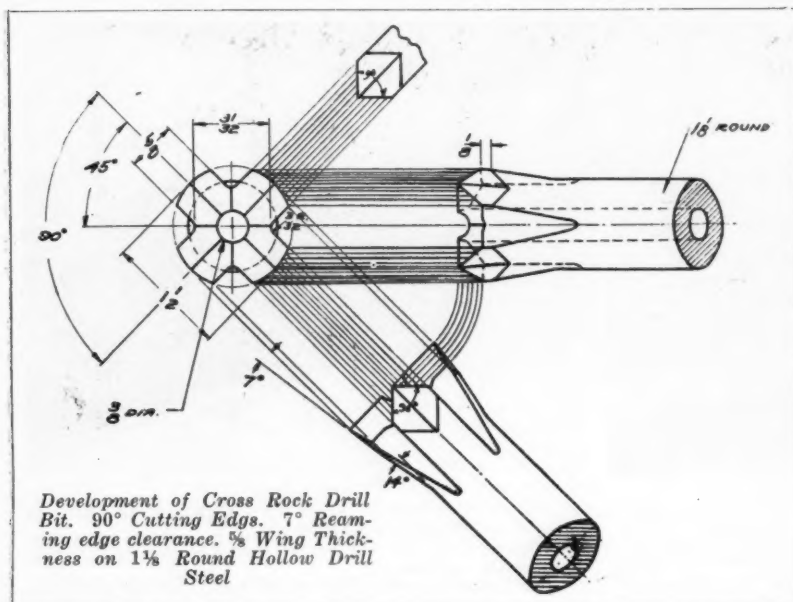
worn away in service. After the drill bit is thus shaped, it is heat treated by quenching and drawing the temper. Carbon is the main hardening constituent of rock drill steel. Therefore, it follows that if the carbon has been removed from that part of the drill bit which determines its reaming and cutting qualities, great injury has been done to the drill bit, for regardless of how carefully the tempering operation may be performed subsequently, it cannot put carbon into material from which the carbon has been removed, and the result is a drill bit which, although it may be perfectly formed, is lacking in stamina by virtue of the absence of carbon in the extremities of the wings with the consequent absence of proper grain refinement due to the bit having been overheated in an oxidizing atmosphere.

A furnace employing either oil or gas fuel for heating drill steel to the correct forging temperature without injury to that steel, briefly describes the Gilman CB5 furnace. It is a forging furnace that has been especially designed for rock drill steel, and is adapted to be installed and used in any drill-steel shop at the mine, quarry, or on contract work. All that is necessary to insure its successful operation is a supply of either light fuel oil or gas, and blower or fan air each at constant pressures. Given these facilities, the CB5 forging furnace will heat the average size of drill bit to a temperature of

1950 degrees F at the rate of one steel every 30 seconds and maintain this temperature for one hour or longer without danger of oxidizing or decarbonizing the material being heated.

Unlike the open fire box type of furnace, wherein the material is subjected to the direct action of the flame or products of combustion, the drill steel is heated in the Gilman CB5 semi-muffle furnace by radiation of heat from the combustion chamber through a carborundum partition, which separates this chamber from the heating chamber, and oxidation is prevented by admitting indirectly a reducing atmosphere from the combustion chamber to the heating chamber. By this method of construction, the heated drill steel for forging is placed upon the same refined basis as that which characterizes the heating of machined parts in the larger and most expensive types of industrial furnaces.

The Gilman forging furnace consists essentially of a rectangular box composed of plate steel walls reinforced and provided with a heavy iron plate securely riveted and bolted together and mounted upon three heavy iron supports. The internal construction of the furnace comprises two chambers, namely, the combustion chamber at the bottom and a heating chamber at the top, the two being separated by a horizontal carborundum tile partition. The top of the furnace consists of two removable iron arches supporting a refractory material lining. It is worth while noting



that the lining of this furnace has been accomplished by the use of standard fire brick.

Directly over the carborundum tile hearth is the opening or mouth in the side wall of the heating chamber into which the drill steels are inserted to be heated. The lower lip or opening of this mouth which is 27 inches long and 3 1/2 inches high consists of heavy cast-iron apron upon which the steel is supported. Forward of this opening is a horizontal bar in the shape of an I beam which serves the dual function of a supplementary support for the drill steel and a housing for the air-blast pipe which provides a blast of low pressure air to deflect in an upward direction the radiant heat from the furnace mouth. A sheet steel guard provides a further assurance of this being accomplished regardless of external influence. It is thus possible for the operator to stand within a few inches of the furnace mouth without undue discomfort.

The refractory material comprising the walls of the furnace is from 7 inches to 9 inches thick and composed almost entirely of standard-sized fire brick. This amount of insulating material insures a uniform temperature in the interior of the furnace by rendering it immune from external draughts or variations in temperature. A clean-out opening 5 inches by 6 inches, located in one of the end walls of the heating chamber, is closed by a tile plug equipped with a handle which makes it possible to clean the furnace with a minimum of effort.

A detachable steel plate which surrounds the burner opening provides a means of replacing the carborundum baffle or its adjacent brick without re-

moving other bricks from the back wall of the furnace, and through this opening it is possible to repair a damaged inner wall of the combustion chamber without disturbing other parts which may not require such attention.

The furnace is adapted to the employment of either an automatic control pyrometer, a signaling pyrometer, an ordinary indicating pyrometer, or a recording automatic signaling pyrometer. Of these four systems, the automatic-control pyrometer has been selected to most advantageously meet the requirements of the central drill-steel

shop, and the same instrument is employed for both the forging furnaces and the automatic heat-treating machines.

#### GILMAN AUTOMATIC HEAT-TREATING MACHINES

Many factors contribute to a successful drill bit and the most important of these is stamina. A drill bit may be perfectly shaped by forging, considering the work for which it is intended, but it is not the best drill bit for that purpose unless it will resist to a maximum the tendency of work to destroy it. The Gilman CE21 heat treating machine automatically heats, hardens, and tempers the cutting end of rock drill steel. It is a self-contained unit comprising an oil or gas-fired furnace of the semi-muffle type, quenching tank, loading table, electric motor, and mechanism for transporting the drill steel to be heat treated from the loading to its point of ejection, all of which is mounted upon a cast-iron base plate. The essentials to insure successful operation are electric power, fuel oil, and water.

A central pedestal mounted upon the base plate supports circular track and a drive head, carrying four arms, which rotates at a uniform speed controlled by a change-speed lever. These arms push around a number of carriers which support the bits to be heat treated. Starting at the loading table, a drill steel is inserted in one of these carriers with its cutting end definitely elevated by the loading table. The carrier is now pushed forward and moves down the path until a definite portion of the bit is inserted in the reducing atmosphere

#### ORDER FOR EXTRA STEEL

Date \_\_\_\_\_ Mine \_\_\_\_\_

Foreman Steel Shop:

Please send the following drill steel extra of the regular lot.

Change Length	1 in.	1 1-8 in.	1 1-4 in.
1st			
2nd			
3rd			
4th			
5th			
6th			
7th			
8th			

This order filled

Date \_\_\_\_\_

And oblige

Foreman

Supt.

Figure B—This form is on blue paper

of the furnace. There are 11 carriers in this position at a time. Each drive arm pushes the entire assemblage of carriers forward for a distance corresponding to the width of one carrier and then travels to the outlet end of the furnace where it picks up the last carrier of the row and pushes it quickly down a steep incline so that the cutting and reaming edges of the heated bit are submerged to a depth of about 3 inches in a fountain of running water in which it remains for a few seconds until this part of the bit is completely cooled. A drill bit which has spent six minutes in the furnace dwells over the bubble for seven seconds and a larger bit is given

exposures exactly in proportion though longer in duration. The arm now overtakes this carrier at the quenching point and proceeds to push it down a gradual slope at a uniform speed, thereby increasing the immersion of the heated steel at a uniform rate and thus tempering it. The tempering period is again proportional, bearing a constant relation to the heating and quenching times. At the end of the tempering or drawing period, three fixed arms carried by a vertical post serve to disengage the drill steel from the carrier and deposit it upon the floor of the drill-steel shop. The carrier is then elevated and pushed

to the loading point and restarts its cycle with another drill steel.

A three-horsepower electric motor mounted immediately below the loading table serves the purpose of moving the driving mechanism through a change-speed gear box. A part of the air which is supplied by the blower system of the shop is conducted to a curved perforated pipe laid on the top of the furnace and immediately rearward of the arc-shaped opening into which the bit end of the drill steel is inserted. This air blast is directed across the top of the opening and serves to prevent egress of the products of combustion and of limiting the distance through which the heat

DR.

## DRILL STEEL SHOP RECORD

Month

Mine

Day	1 in. Steel								1 1-8 in. Steel								1 1-4 in. Steel								Shanks and Bits
	1st	2nd	3rd	4th	5th	6th	7th	8th	1st	2nd	3rd	4th	5th	6th	7th	8th	1st	2nd	3rd	4th	5th	6th	7th	8th	

## DRILL STEEL SHOP RECORD

CR.

Month

Mine

Day	1 in. Steel								1 1-8 in. Steel								1 1-4 in. Steel								Broken Steel
	1st	2nd	3rd	4th	5th	6th	7th	8th	1st	2nd	3rd	4th	5th	6th	7th	8th	1st	2nd	3rd	4th	5th	6th	7th	8th	

## DRILL STEEL MEMO

Mine

Date

From Shop to Mine					From Mine to Shop				
New Shanks	No. of Drills			Change	No. of Drills			Broken Steel	
	1 in.	1 1-8 in.	1 1-4 in.		1 in.	1 1-8 in.	1 1-4 in.		
				2 ft.					
				4 ft.					
				6 ft.					
				8 ft.					
				10 ft.					
				12 ft.					
				14 ft.					
				16 ft.					

O K by \_\_\_\_\_ Supt. O K by \_\_\_\_\_ Checker

Figures A and C. Figure A, the Drill Steel Memo, is printed on pink paper



travels up the drill steel. The furnace temperature which is maintained approximately 150 degrees higher than the upper critical range of the steel is indicated by the electric pyrometer, the thermocouple of which is inserted in the top center of the furnace immediately forward of the slot through which the drill steels pass. Any variation in the temperature of the furnace causes a small motor to operate and either open or close the fuel oil control valve which thus automatically adjusts itself so that a uniform temperature is maintained. Another thermocouple inserted through the wall of the furnace at its outlet end and adjacent the heated drill bit when in its last position before it is transferred to the water bubble, provides a means of determining by comparison the exact temperature of the heated drill bit in degrees Fahrenheit by reading the indicator of the wall instrument.

It will, therefore, be seen that the automatic heat treating machine is a complete unit comprising furnace, quenching tank and mechanism for coordinating the function of each feature. In operation the man places the unhardened drill steel in the jaws of one of the carriers. The machine automatically transports it from the loading table into the furnace, where its temperature is progressively raised until the correct heat for quenching is attained, when it is quickly transferred into the quenching tank, where for a period of a few seconds the cutting and reaming edges of the bit are subjected to the impinging action of a jet of cold water, which imparts to them a case of maximum hardness and density (the desired wear resisting qualities). Then, to provide a support for these hardened edges, a core of the required toughness is secured by slowly submerging the bit, as it is caused to travel through the length of the quenching tank. When thus cooled, it is raised from the quenching tank and ejected from the machine, ready for use.

#### RESULTS

The results or savings from this plant, which has now been in operation approximately six months, may be measured in several ways, or, perhaps, I should say, stated in several ways.

First, a decrease in the number of drill steels required to do an equivalent amount of work, as compared with former usage. This, it will be readily seen, has meant the production and maintenance of a greatly more efficient bit.

Secondly, a materially noticeable reduction in wastage of steel formerly resulting from the breakage of the steel body or the wing of the bit, due undoubtedly to the fact, that the bit, which for all practical purposes may now be said to be perfectly formed and heat

treated, possesses the necessary penetrative capacity to cushion the steel body.

Likewise, it will be apparent that this same proper penetrative capacity of the bit will result in lower machine drill maintenance, because of the cushioning effect resulting from proper rock penetration from the drill bit.

It may be interesting to note that the breakage of steel under the perfected methods and new shop is less than one steel in two thousand.

Thirdly, the savings in cost of operation over previous practice. It is a self-evident fact that in running one central plant to serve 12 to 14 mines instead of 10 or 12 plants previously operated, avenues are created for economies not otherwise obtainable.

We are also finding that as time passes the cost keeps falling materially as incidental refinements of methods are made.

While the comparative showing is satisfactory, we do not feel that the last word has been said in cost reduction.

In the company's practice each mine pays a definite uniformly alike price per bit and shank, so that the shop virtually sells each mine a steel service, the steel inventory being the property of the shop.

#### CONTROL

Like any factory a definite system for controlling production must be established in order to gauge the production on the most economical basis.

Figure A is a pink form used to establish the initial order for each mine and to determine the daily continuing production for each mine to be served.

The left-hand column provides for the work to be done in the plant. The right-hand column to establish information for the steel inventory.

Figure B is a blue form used by the mine superintendent to notify of increased requirements. Likewise, it may be used to decrease his regular allotment.

Figure C is a ledger form covering a system of debits and credits over a monthly period of the "sales" made to each mine and constitutes the authority upon which the service charge is made against the mine.

Books are maintained on the steel shop to show cost of operation and production as might be done in any factory.

Among them will be found the steel inventory account, comprising such items as tonnage of steel purchased by the plant, wastage, and salvage.

Other items include labor, light, fuel, compressed air, rental, supplies, repairs, truck license, interest, plant investment and depreciation. Opposed to this is its sales account to the company's mines.

It is not intended to have the steel shop show a profit, but as savings are effected they are passed on to the mines through a lower service charge per steel.

## LEAD INDUSTRY IN 1926

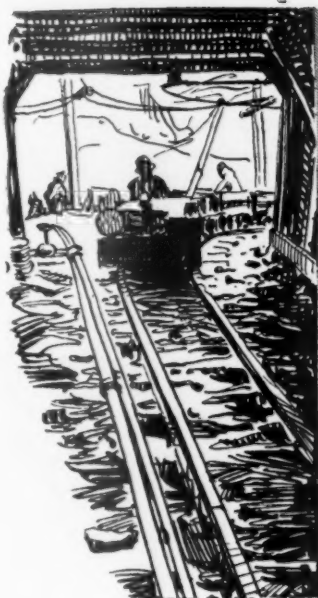
(Continued from page 15)

as we have witnessed, means a loss of \$3.00 per ton. So that if the price of silver stabilizes around 55 cents per ounce, instead of 65 cents per ounce, the price of lead must be such as will compensate the silver-lead miner for this loss.

If the price of lead should drop much below eight cents, the tendency would be toward decreased production, because it would necessitate the mining of only the higher grade ores. Moreover the incentive for prospecting and developing would cease. If the demand for lead should exceed the present production an increased price would naturally result, and the mines would gradually respond, due to the ability to mine lower grade ores. In fact this is the only way that increased production would be brought about. Should the demand cause a permanently higher price for lead—say 10 or 11 cents per pound—it would stimulate the scouting and prospecting for new lead deposits, and justify the further development of known ore bodies along the lines of mining lower grade ores.

The protection which the tariff on lead gives to the lead miner is vital to the industry. The present tariff laws provide for a duty of 1½ cents per pound on the lead contents of imported ores and mattes, and a duty of 2½ cents per pound on pig lead, bullion and lead alloys of all kinds. Were it not for this protection lead from Mexico and other foreign countries could move freely into this country and thus come into competition with our own lead in our own markets. By reason of this tariff Mexican and Canadian lead must seek a market in Europe and the Orient. Usually the difference between the London or foreign price and the New York price is about 1½ cents per pound, or the amount of the duty on lead in ores. Without this duty the New York price would immediately adjust itself to the basis of the London or world price, which at the present time is somewhat under 6½ cents per pound. At this price many lead mines could not operate at a profit under present high-cost conditions; only high grade ores could be mined and decreased production would follow.

The reason that a duty on lead really protects the lead miner is because the United States consumes all the lead it produces—in other words, we do not produce a surplus which would have to seek a market abroad, as is the case, unfortunately, with the copper producer and the wheat farmer, both of whom have to accept the world price for their surplus production. As the lead miner needs and is satisfied with the protection the present tariff affords, no attempt should be made to increase the duty or modify it in any way.



# COAL

## PRACTICAL OPERATING MEN'S DEPARTMENT

NEWELL G. ALFORD, Editor

*Practical Operating Problems of the  
Coal Mining Industry*



## CONCRETE SHAFT LININGS AT PENNSYLVANIA BITUMINOUS COAL MINES\*

*A Summary Of Detailed Reports To Mine Timbering Section, National Standardization Division,  
The American Mining Congress, On 27 Installations in Illinois, Wyoming, and New Mexico*

**A** YEAR ago the subcommittee on the use of concrete in mine timbering, of the National Standardization Committee, The American Mining Congress, presented, as its report, a résumé of a study of failure on concrete shaft linings at Pennsylvania bituminous coal mines. This work was continued by the committee in the current year, and, in addition to getting data on six more installations in Pennsylvania, detailed reports were obtained on 27 installations in Illinois, Wyoming and New Mexico. Two of the linings near Cambria, Ill., are of "gunite."

The following list of questions was answered in each case:

1. Is shaft downcast, upcast or hoisting?
2. Is shaft rectangular, circular or elliptical?
3. Date when lining was installed?
4. How deep is shaft? (If not all, what part is concreted?)

\* Newell G. Alford, consulting engineer, Pittsburgh, Pa.; chairman, Committee "Use Concrete in Mine Timbering," National Standardization Division, American Mining Congress.

5. Were any water-bearing strata encountered?
6. Was shaft wet or dry when being sunk?
7. What is thickness of concrete lining? (Give maximum and minimum.)
8. Mixture of concrete used in the lining?
9. Make of cement used?
10. Kind of fine and coarse aggregate used?
11. Was concrete reinforced? (If so, describe how.)

12. What water-proofing material was used, if any?
13. Was drainage supplied behind the lining?
14. Was concrete dense as possible? (Was workmanship good?)
15. Was any grouting done?
16. If grouting was done, was the object only to aid sinking or to permanently protect the concrete lining?
17. When was this lining last carefully inspected?

18. Is lining now wet or damp? (Leakage in gallons per minute.)

19. If surface of concrete is spalling off, when did this begin?

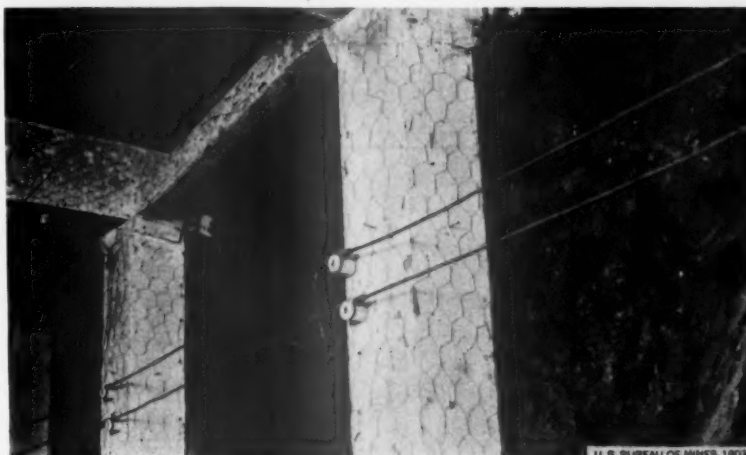
20. If concrete is not in good condition, describe same.

21. What remedies have been used on the lining?

22. What has been the extent of lining repairs to date?

23. Has lining been totally replaced?

Such of the an-



*Mine Timbers Prepared for Guniting*

swers as could be conveniently tabulated are shown in the attached Table I.

#### THICKNESS OF LINING

This, of course, varies greatly in any one shaft, but the range of thickness on the installations covered is:

	Maximum inches	Minimum inches
15 shafts in Illinois .....	36	8
5 shafts in Wyoming .....	24	12
6 shafts in Pennsylvania .....	30	12
1 shaft in New Mexico .....	16	12

The above does not include two "gunite" linings, which were 4 inches thick at the top of shaft and 2 inches thick at the bottom. The shafts are tabulated as Illinois Nos. 10 and 11.

#### MAKES OF CEMENT USED

Good, standard cement was used in each case.

#### COARSE AND FINE AGGREGATE

In the Illinois shafts the sand was washed, in some cases from the Ohio River, in others from the Mississippi River. The coarse material at Illinois shafts Nos. 1, 2, 3, 8 and 9 was crushed and sized limestone; at Illinois Nos. 4 and 5 it was crushed and sized sandstone; at Illinois Nos. 6 and 7 it was crushed sandstone and river gravel; and at Illinois Nos. 10, 11, 12 and 13 it was medium river gravel. The crushed stone was sized to either  $\frac{1}{2}$ " by  $\frac{3}{4}$ " or  $\frac{1}{2}$ " by 1".

At Pennsylvania shafts Nos. 3 and 4 the coarse material was crushed limestone sized to  $\frac{3}{4}$ " by  $2\frac{1}{2}$ "; at No. 2 it was Allegheny River gravel; at Nos. 1, 5 and 6 it was crushed stone larger than  $\frac{1}{2}$ ".

In the five Wyoming linings river gravel was used as coarse aggregate in all cases except one, where gravel was mixed with native crushed stone.

#### WATERPROOFING

Waterproofing was used only in two cases. Eight percent of hydrated lime was used in Pennsylvania shaft No. 2 and a waterproofing compound was used with the cement in grouting Pennsylvania shaft No. 5. The surface in Illinois shafts Nos. 2 and 3 was "gunited."

#### DENSITY OF MIX

In all cases the mixture was reported as "dense as possible"; please note the mixtures reported in answer to question No. 8.

The "gunite" in Illinois shafts Nos. 10 and 11 was reported as being very dense; the mix was 1 of cement to  $3\frac{1}{2}$  sand.

#### WORKMANSHIP

This was reported as "good" in all cases except Pennsylvania shaft No. 4. The weather was very unfavorable when this lining was installed, freezing occurred after water broke through the lining which was recently totally replaced with brick.

DATA ON CONCRETE SHAFT LININGS—PART I

	PENNSYLVANIA (Bituminous)						ILLINOIS		
	1	2	3	4	5	6	1	2	3
1. Is shaft downcast, upcast, or hoisting?	.....	Upcast	Hoisting and Upcast	Manway and downcast airway	Hoisting shaft for men	Upcast (Manway)	Upcast hoisting	Upcast hoisting	Downcast 1 compartment, Upcast in other
2. Is shaft rectangular, circular, or elliptical?	Elliptical	Circular	Elliptical	Elliptical	Rectangular	Rectangular Elliptical ends	Rectangular	Rectangular	Rectangular
3. Date when concrete lining was installed?	May 1, 1924	Sept., 1923-March, 1924	1915	1916	1922	June, 1923, to Jan., 1924	Spring, 1923	1920	1920
4. How deep is shaft?	200 ft.	461 ft.	104 ft.	98 ft.	348 ft.	423 ft.	450 ft.	418 ft.	419 ft.
5. Were any water bearing strata encountered?	Yes	Yes	Yes	Yes	Yes	Yes	Yes-17 ft. quicksand	Yes	80 ft. from surface, 30 ft. from bottom
6. Was shaft wet or dry when being sunk?	Wet	Dry	Wet	Wet	Wet	Wet	Wet	Wet	Yes-6 ft. quicksand
8. Mixture of concrete in lining?	1-2-4	1-2-4	1-2-4	1-2-4	1-2-4-5	1-2-4	1-2-4	1-2-4	1-2-4
11. Was concrete reinforced?	Yes	Yes	No	No	No	Yes	Yes	No	No
13. Was drainage supplied behind the concrete lining?	Bleeder pipes	No	Bleeder pipes	Water ring	No	Water rings and bleeder pipes	Sheet steel casing	No	No
15. Was any grouting done?	Yes	Yes	No	No	Yes	To protect lining	No	.....	No
16. If grouting was done, was the object only to aid sinking or to permanently protect the concrete lining?	To protect lining and seal water	Both	.....	.....	To protect lining and stop water going down shaft	To protect lining	.....	.....	.....
18. Is lining now wet or damp?	Damp	Slightly damp	Wet	Dry	Damp	Portion wet	Wet	Wet	Damp
19. If surface of concrete is spalling off, when did this begin?	No	.....	50 G. P. M. 1917	Summer, 1917	No	No	No	No	No



## INSPECTION OF LININGS

All of these linings were inspected recently in connection with collecting this data.

## SURFACE DISINTEGRATION

Of the Illinois linings only No. 8 has spalled off to any extent, here slow disintegration developed slowly where water seeped through the lining. These spots have been patched. In this instance, note that the shaft passed through a water-bearing stratum of rock, and that the attempt to install bleeder pipes was unsuccessful and that there was no grouting of the rock.

In Pennsylvania shaft No. 3 reversing of the fan caused alternate freezing and thawing of seepage water, which resulted in spalling off of 2 inches of the surface of lining. In shaft No. 4, evidently an exception, the lining failed almost completely and was recently replaced with brick.

## DRAINAGE

In all the Illinois shafts where the linings extend the full depth and where the linings are in satisfactory condition, adequate drainage is supplied either with bleeder pipes or water rings or a combination of both.

At Pennsylvania shafts Nos. 3 and 4 the trouble was obviously due to other causes than drainage, which are apparent and were avoidable.

In the Illinois shafts Nos. 10 and 11, where "gunite" was used, the lining was placed on wire laid on 4" by 8" shaft timbers; both water rings and bleeder pipes are used to handle the water. In shaft No. 10 a drill hole was put down in the location where it was proposed to place the air shaft, and it did not encounter clay, quicksand or gravel, but, before the sinking was begun, the location of the shaft was moved south approximately 30 feet, and when put down cut the edge of the water-bearing stratum. The company was unprepared to handle the inflow of sand, clay and water, which caused several days' delay before it was controlled. It was necessary to timber it off on one side and one end of the shaft only, but before the inflow was stopped quite a large area had washed out back of the shaft wall, which was filled in with straw and timber before the timber lining was set in place.

After the shaft was completed, and before placing the gunite lining, the temporary bleeder pipes were replaced with larger ones, and every precaution was taken to confine the water to the water ring placed at the location.

About a year after the shaft had been completed the quantity of water from the bleeder pipe seemed to increase and an 8" drill hole was put down to the coal level, through the portion filled in with straw and timber, and the water has been drained through it since that time.

DATA ON CONCRETE SHAFT LININGS—PART II

## ILLINOIS

	4	5	6	7	8	9	10	11	12
1. Is shaft downcast, upcast, or hoisting?	Hoisting	Downcast	Downcast	Main Upcast	Downcast Air-shaft and Manway	Main hoisting Upcast	Downcast	Upcast—hoisting	Upcast and Hoisting
2. Is shaft rectangular, circular, or elliptical?	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular
3. Date when concrete lining was installed?	1917-1918	1917-1918	1918	1919	1917	1917	June-July, 1922	Nov., 1921	Fall, 1919
4. How deep is shaft?	300 ft.	280 ft.	300 ft.	316 ft.	310 ft.	320 ft.	117 ft.	111.4 ft.	207 ft.
5. If not all, what part is concreted?	All	All	All	All	All	All	"Gunite" lined	"Gunite" lined	All
6. Were any water bearing strata encountered?	Yes	Yes	Yes	Considerable	Yes—Vertical fissure	Yes—Vertical fissure	Yes	None encountered	No
7. Was shaft wet or dry when being sunk?	Wet	Wet	Wet	Very wet	Wet	Wet	Wet	Fairly dry	Fairly dry
8. Mixture of concrete in lining?	1-2½-4	1-3½-4	1-2-4	1-2-4		1-2-4	1 cement to 3½ sand	1 cement to 3½ sand	1-2-4
9. Was concrete reinforced?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10. Was drainage supplied behind the concrete lining?	Bleeder pipes	Bleeder pipes	Bleeder pipes & water rings	Bleeder pipes & water rings	Bleeder pipes not successful	Bleeder pipes not successful	Water rings & Bleeder pipes	Bleeder pipes & water rings	Water ring
11. Was any grouting done?	No	No	To protect lining	To protect lining	Not of soil	No	Yes	No	Yes
12. If grouting was done, was the object only to aid sinking or to permanently protect the concrete lining?	.....	.....	To protect lining	To protect lining	.....	.....	Grouting not successful Purpose—to aid sinking	No grouting done	To insure bond between sections at joints
13. Is lining now wet or damp? (Leakage in gallons per minute.)	Trace	Wet 2 G. P. M.	Dry	Some Small leakage	Wet 10 G. P. M.	Damp ½ G. P. M.	Damp	Slightly damp	Damp
14. Is surface of concrete spalling off, when did this begin?	No	Only slight spalling	No	No	1921	No	No	No	No

The lining is in excellent condition today and there is no indication of disintegration.

From the data so far reviewed your subcommittee believes that the factors of most importance, where natural water accumulates in the strata about a shaft, are ample drainage for the linings and the designing, mixing and placing of concrete in accordance with the best practice.

It is seen that in mine-shaft linings difficulty is most probable in climates subject to wide variation in temperature or prolonged seasons of excessively cold weather.

This committee will continue its work on concrete shaft linings through the coming year with the idea of making definite recommendations in its next annual report.

### FUTURE FOR COPPER

(Continued from page 19)

merest fraction of an ounce, a segment of a teaspoon, yet the people of the United States spend more each year for luxuries than the rest of the entire world. It is well within the bounds of possibility that the American public can be induced to purchase articles of sterling silver in vastly greater volumes.

As for the future of copper in the domestic markets it is safe to say that the progressive development of American industries will result in still greater increases in the consumption of the red metal and its principal alloys, brass and bronze. Routed deeply in the consciousness of the American people is the knowledge of the unequaled value of copper and its alloys for uses where they serve best. Upon this firm foundation we shall continue to build with confidence.

### DIFFERENTIAL FLOTATION OF COMPLEX SULPHIDE ORES

The importance of lead-zinc-iron separation by differential flotation has led research into other possible fields, states Thomas Varley, metallurgist, Bureau of Mines, in a recently issued report. One important step is at the copper concentrators where mill tests are following laboratory experiments in "dropping" pyrite from copper concentrates, resulting in higher grades of copper products. There are economic limits, of course, where the loss of pyrite affects recoveries of copper as well as gold and silver.

The differential separation by flotation of lead and copper from zinc in sulphide ores is developing rapidly. There are several operating plants where this treatment is successfully installed, and while the separation of the minerals from each other is not quite as clean cut as in lead-rial is accomplished most advantage-are promising.

DATA ON CONCRETE SHAFT LININGS—PART III

	ILLINOIS			NEW MEXICO		WYOMING				
	13	14	15	1	2	3	4	5		
1. Is shaft downcast, upcast, or hoisting?	All three	Airshaft down Hoist upcast	Downcast	Downcast	Upcast	Upcast	Upcast	Upcast		
2. Is shaft rectangular, circular, or elliptical?	Rectangular	Rectangular	Rectangular	Rectangular	Circular	Circular	Circular	Circular		
3. Date when concrete lining was installed?	Fall, 1919	1918-1919	Aug. 1921- Feb., 1922	Nov., 1923	Aug., 1925	July, 1921	Sept., 1925	July, 1924		
4. How deep is shaft? If not all, what part is concreted?	207 ft. All	300 ft. All	..... All except 40 ft.	172 ft. All	360 ft. 45 ft. rubble masonry "Girders" on air side	60 ft. 40 ft.	160 ft. 20 ft.—balance in rock formation	70 ft. 30 ft.		
5. Were any water bearing strata encountered?	No	Yes	Yes	Yes	Yes	No	Yes	No		
6. Was shaft wet or dry when being sunk?	Fairly dry	Wet	Wet	Wet	Wet	Dry	Wet	Dry		
8. Mixture of concrete in lining?	1-2-4	1-2 1/2-5	1-7	1-2 1/2-5	1-2-4	1-2-4	1-2-4	1-2-4		
11. Was concrete reinforced?	Yes	Yes	Yes	Yes	No	No	No	No		
13. Was drainage supplied behind the concrete lining?	Water ring	Bleeder pipes	Water ring	Bleeder pipes	Bleeder pipes	Bleeder pipes	Bleeder pipes	Bleeder pipes		
15. Was any grouting done?	Yes	Very little	No	No	No	No	No	No		
16. If grouting was done, was the object only to aid sinking or to permanently protect the concrete lining?	To insure bond between sections at joint	To protect lining slightly	None	.....	.....	.....	.....	.....		
18. Is lining now wet or damp? (Leakage in gallons per minute.)	Damp	.....	Wet	Wet 10 G. P. M.	Damp	Damp	No	No		
19. If surface of concrete is spalling off, when did this begin?	No	No	No	Slight spalling	No	No	No	No		

## USE OF CONCRETE IN MINE TIMBERING

*Use Of Concrete As Substitute For General Mine Timbering Has Several Inherent Disadvantages, Such As Increased Difficulty In Transportation, First Cost, Flexibility Of Products, But In Its Sphere It Is Unequalled*

By C. E. SWANN\*

THE Union Pacific Coal Co. has constructed all its permanent main return air course overcasts of reinforced concrete for over 15 years, except in mines where height of coal seam allow the overcasts to be driven in the coal, as at the Hanna and Cumberland Mines in Wyoming.

At the Union Pacific Coal Co.'s Wyoming mines located in the Rock Springs, Reliance, Winton and Superior districts there are over 200 reinforced concrete overcasts over double-track partings near main slopes or over single track panel planes or panel slopes. The average length of these overcasts is 14 feet, average width 12 feet and average height from floor of seam to floor of overcast is 7 feet. The overcasts average 16 cubic yards of concrete costing \$300 to \$325, each in place, while shooting down and loading out rock for approaches and overhead air course ranges from \$150 to \$250, which makes the completed job cost around \$500, but the company has the satisfaction of knowing that under ordinary conditions their main return overcast worries are over for the life of the mine.

On panel planes and panel slopes, where the life of panels vary from two to four years, a combination steel and concrete overcast is being used, which is constructed as follows: End walls concrete, floor of overcast made of removable  $\frac{1}{4}$ " steel plates with  $\frac{1}{2}$ " x 2" x 2" angle irons riveted on each side for bolting the sections together. Rails are placed across each side under the overcast floor to give support for any required side-wall construction necessary to make an air-tight job. Loose rails are spaced on top of floor to distribute the impact of falling rock over the entire floor and floor of overcast is covered with asphalt to protect same from moisture.

These overcasts are giving complete satisfaction at the Winton Mines, but have not been in use over a sufficient period of time to determine their average useful life.

Another form of combination steel and

concrete overcast is being tried out on main return overcasts to avoid the expensive overhead form work necessary on long span overcasts across main partings. They are constructed as follows: The end walls are built of concrete and double 60-lb. rails are spaced on 15-inch centers to form the floor support and these are covered with 15" x 24" x 4" precast reinforced concrete blocks laid up with cement mortar and finishing coat of cement mortar is placed over the top. The side walls at the top to form an air-tight joint are built in the usual manner. The rails used will be exposed to the intake air and are covered with asphaltum paint or gunited to resist any corrosive action which might occur.

Numbers of this type of stopping have been in use 10 or more years and are in good condition at the present time and give every indication of several years more of useful life.

The Union Pacific Coal Co., in recent years, has adopted the circular type of air shaft as standard and has abandoned the use of timber for air-shaft lining, either using rubble masonry gunited on the air side or concrete lining for supporting all loose material above a solid formation on which the wall can safely be built.

All permanent stoppings between intake and return airways in the Union Pacific Coal Co. mines are built of concrete, rubble masonry or hollow tile and the stopping faces are gunited at intervals to prevent loss of air through cracks or along the edges of the coal ribs and at times improperly built overcasts are gunited for the same purpose.

During the last two years experiments

have developed a superior face coating for overcasts, stoppings, etc., consisting of 3 parts sand, 2 parts shale dust and  $\frac{1}{2}$  part cement. This mixture adheres well to rubble masonry, rough concrete or tile walls and sets extremely hard.

The Union Pacific Coal Co. is investigating the advisability of building large overcasts and stoppings from precast hollow concrete blocks, which can be made at a small plant located near the unloading station of the raw material and delivered as needed for any size concrete stopping or overcast. It has been determined that an overcast built of precast concrete blocks with steel floor supports can be built much cheaper than a concrete overcast formed and built inside the mine.

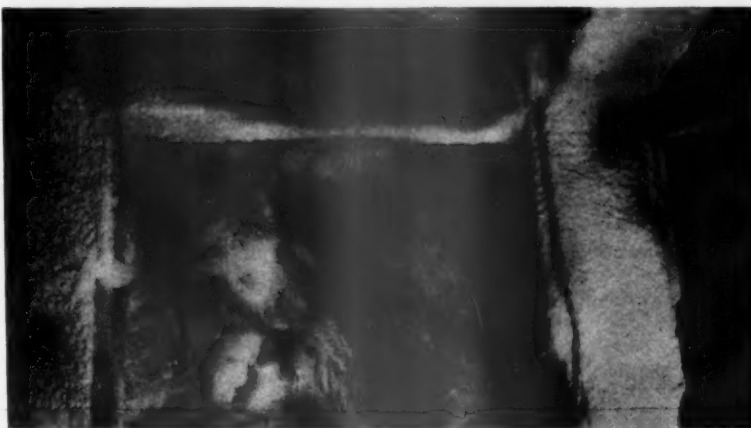
Hollow tile has been used for the same purpose, but is not satisfactory under heavy cover or squeeze condition.

### PRESENCE OF WATER IN CRUDE OIL

WATER and crude oil are generally considered immiscible. In a pure mineral oil, such as an insulating oil, the solubility of water is estimated at 0.0003 percent, according to the Bureau of Mines, Department of Commerce. In crude oils, however, water may be in apparent solution in much larger quantities. Usually water exists in crude oil in finely subdivided particles rather than in solution. Only in exceptional cases, if ever, is water the product of chemical combination.

When water occurs in producing oil wells, mechanical agitation of any kind is apt to disperse small particles of the water throughout the entire body of the oil. As a result the oil generally contains water in emulsion and in suspension; the mixture is called "cut oil."

The treatment of oil field emulsions is one of the most important problems affecting the petroleum industry of the United States. Various methods of treating such emulsions are described in Bureau of Mines Bulletin 250, by D. B. Dow, which may be obtained from the Superintendent of Documents, Washington, D. C., at a price of 25 cents.



United Timbers and Walls

\* Chief engineer, Union Pacific Coal Co., Rock Springs, Wyo.



# THE NATION'S VIEWPOINT



**W**HILE discussion of the five-day week is rampant it is interesting to note the following published in *Forges Magazine*:

"There's a valuable lesson for many employers in the following words of E. L. Cord, the 32-year-old president of the Auburn Automobile Company, who uses his head and heart as well as his capital in business.

"The right sort of men don't work for money. They work for what money will bring, and that's what I



Richmond (Va.) Times-Dispatch  
An Argument In the Kitchen

try to help them earn—not money, but the real satisfactions of life, the things worth while. One man came to me for half his former salary. All his life he had wanted a home of his own. I helped him get that home. When he moved in, neither of us knew how he would complete the payments on it, but we found a way.

"When men come to work for you with that spirit there simply aren't enough days in the week for them to work. When they come to you because you offer them more than they have made elsewhere, there's only one day in the week and that's pay day—and there's only one hour in the day and that's the quitting hour."

66

The general notion that wages are paid by employers, is denied in the following article published in *Iron and Coal Trade Review*:

"Most persons, looking at the evident fact that a workman gets his pay envelope every week or a fortnight from his employer's cashier, take it for granted that wages are paid by the employer. In the same way trade unions look to the employer when they want an addition to wage rates. At the immediate moment and in some cases over a long period, the employer does in fact bear the cost of an addition to the wages bill especially if the employer is not an individual, but a large body of shareholders, who act through a salaried staff and board of directors, and have little or no power over the business which they own. In the case of a railway company, for example, wages may be raised considerably, and indeed were raised during the war and the subsequent period of Government control, without any immediate addition to the charge for services rendered to the public by the railways. Other cases of this kind occurred, and so workmen in general formed the opinion that their wages could be increased without any injurious reaction upon trade. At the end of the control period, however,

it became clear that the railways were going fast on the down grade to bankruptcy; rates and fares had to be raised in order to cover working expenses and a return on capital.

"In an ordinary business, wages are not really paid by the employer; all that he does is to advance them until he can get the money from the customers to whom his business has supplied certain goods or services. As Sir Hugh Bell put it in his lecture at the London School of Economics on November 30, a workers' wage



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All In the Same Boat This Time

is paid within a fortnight or so of his doing the work, but it is long afterward that the manufacturer or owner realizes the material out of which the wages came. In the iron and coal industries a capital of some £250 is required to put each man to work. This, of course, has to be advanced by the employer in the hope that he will get it all back, with additions to compensate him for his abstinence and for the risk he has run. If he fails to find a market for his coal or his iron, his business will come to an end, and there will be no wages for his workmen. If there is only a poor market, i. e., if the prices he gets are low so that the return on his capital



Wallace Press-Times

Needs Re-Touching

is less than he could get from war loan, no more capital will be forthcoming, and his business will languish instead of advancing. Nowadays, as Mr. Henry Ford points out, a business cannot stand still; it must either go forward or go back, and it cannot go forward if wages absorb the whole price of its product. In coal mining about 75 percent of the value of the coal is spent in paying wages; or, put differently, 15 cwt. out of each ton go to the miner and a further 3 cwt. for things that are not wages.

"Wages in industry, Sir Hugh Bell maintains, must be determined solely by the amount the individual earns by the efforts he puts forth; therefore all questions of family income and standard of living are subordinate to the question of what the person earning the wage has done for it. We imagine that Sir Hugh is speaking only of the competitive occupations; in the Government or municipal services wages may be fixed by arbitrary standards so long as the taxpayer or ratepayer is willing to pay the bill."

Coal, Oil and the Sherman Law, is the title of the editorial quoted below, which appeared in the *West Virginian*, of Fairmont, W. Va., based upon discussions which took place at recent conventions of two national organizations:

"Wednesday Secretary of Labor Davis speaking before the American Mining Congress, urged the soft coal industry to get upon a solvent basis. And the day before, speaking down at Tulsa, W. S. Farish, president of the American Petroleum Institute, suggested that in furtherance of a conservation policy the Sherman act be amended to permit operators working on a given body of oil to pool their interests. At first glance there might

not seem to be much connection between these two speeches, but there is. Not that the head of the great national organization of oil producers and the head of the Government's labor department are collaborating in any way. It is merely that the obvious remedy for waste and bankruptcy in the oil industry is about the only thing that would permit of practices in the coal industry which will put it on its feet financially and check the overproduction.

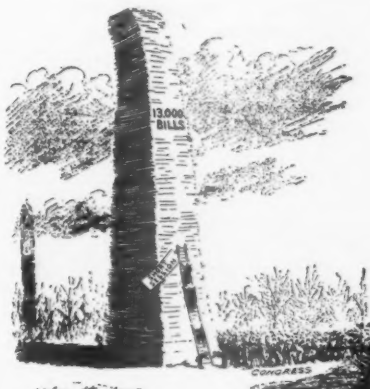
"The country accepts the doctrine that a public service corporation, or a railroad is entitled to a fair return on the money invested, but if three coal men meet on a corner and compare notes as to prices and agree that they will not sell coal at less than \$2.25 say, which would be a fair figure at the present level of wages, and other costs, they are, in the eyes of the law, criminals, and for some obscure reason the very men who would be benefitted by a change in the statutes which would enable coal men to get on the same basis with the rail-

"Much of the trouble of the coal industry, speaking of it as a financial risk, comes from lack of reliable news about it. Even the figures for coal mined are but estimates, and everything else is mere guess work. If there were some way in which the coal producers could get together in a financial organization, or several financial organizations, intended to protect their legitimate business interests, just as the rubber manufacturers are permitted to form a forty million dollar pool to make collective purchases in the open world market, there would be some incentive to perfect the statistical information about the industry and thus enable every one to get some idea of what risks are involved in putting new capital into it.

"But one thing is sure, there will be no improvement in the situation until both the oil men and the coal men get together and, after agreeing among themselves upon a policy which will appeal to the intelligence of the country as a statesmanlike effort to put the two great mining industries on a sound basis, begin to put pressure upon Congress in favor of it."

The following quotation is from an editorial appearing in the *Trade Union News* of Philadelphia. That strikes have no place in a civilized community is forcefully presented. They say:

"Billions of dollars were irretrievably lost to the business men and wage-earners of this country due to strikes, etc., during the last decade, and more billions will be wasted in the same way during the next ten years unless something is done to bring capital and labor into more



*The Long and Short of It*

roads or the public service corporations, recoil in horror when such a policy is suggested.

"The original suggestion that the real remedy for criminal waste in petroleum production probably lay in amendment of existing law rather than in changes in technique came from Charles E. Hughes, and as far as this newspaper has been able to observe he never elaborated upon it. It is a pity some one in whom the country has entire confidence does not speak out plainly regarding the harm the Sherman law is doing and help to educate the business public to an understanding of the necessity for changes in the national policy with regard to trade combinations, price fixing and the exchange of trade information.



*His Work Is All Laid Out For Him*



*Under the Big Tent*

friendly relations. Fortunately, a better understanding now exists between the two forces than ever before, but much is yet to be done to entirely eradicate the frightful and calamitous financial loss caused by strikes, walk-outs, lockouts, boycotts and other industrial disputes.

"Over in the city of New York last week another strike—the cloak-makers—was settled in part after having been in operation 20 weeks and causing a loss of \$2,000,000 to the workers, while the loss to the manufacturers is believed to have been nearly as great. Long will the people of this country remember the big strike of the anthracite miners a year ago, which involved 158,000 men and caused a loss in wages amounting to \$150,000,000. The loss of profits to the operators must also have reached into the millions. How much has been lost in wages and profits in the long-drawn-out textile strike at Fassaic has not as yet been published, but the loss there must also be immense, and the end is not in sight. That intelligent and humane men and women—employers and employees—are still forced to fight each other, industrially, with these primitive weapons, which cause such great loss and suffering, is simply asinine. Proud of their intelligence and humanity, men should settle all industrial disputes at the conference table instead of in the field of strikes, as was urged by William Green, president of the American Federation of Labor, in a recent address on arbitration. And just as this generation regards war as a relic of barbarism, so will future generations regard strikes, lockouts, etc., as relics of an unenlightened age."

Wm. H. Barr, president of the National Founders Association, is of the opinion that the tax surplus belongs to the taxpayer. In a recent article he says:

"It is regrettable that there seems to be such a wide divergence in Washington on the question of tax revision, and that an agreement at the present session is unlikely. It is not necessary that such an agreement should definitely decide for revenue revision at this session, but rather that there should be a general understanding as to its scope and the time when it can be best put into effect. The danger in the situation as we see it, is the pressure which is developing to take advantage of the disagreement as to the method of distribution of surplus to the taxpayers by bringing about a recrudescence of pork barrel expenditures. Whatever the amount of surplus is or may be, the fact remains



Wallace Press-Times

#### Another European Visitor Recalled

that it is excess taxes collected from the people. When the Revenue Bill now on the statute books was enacted, it was estimated that there would be no surplus, and because of that estimate certain taxes were continued in effect and the reduction of the income tax was not made as great as it might have been. Time has shown that these estimates were wrong and a heavy surplus has accumulated. This money belongs to the taxpayers and not to consumers of political pork throughout the country. We have no opinion to express as to whether Mr. Coolidge's rebate, Mr. Mellon's credit or the Democrat comprehensive plan of revision is the best. We feel, however, that every corporation in the country and every individual paying taxes should take a firm position against turning the surplus into the public buildings or rivers and harbors sink-holes which are always in the minds of some politically-minded gentlemen."



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#### The Modern David

The Columbia, S. C., Record, in commenting upon an editorial which appeared in the December issue of THE MINING CONGRESS JOURNAL, agrees that if cotton is to receive Government aid, why not every other industry. They say:

"Cotton must be saved from collapse." So run the headlines of the nation's daily newspapers. But if cotton, why not copper, coal, clay, and going on down the alphabet, gold, silver, lead, zinc, corn, beans, garden seed and cabbage?

"The question is boldly asked by THE MINING CONGRESS JOURNAL and we have been considerably surprised that it has not been propounded by every other class publication from Maine to California and from Canada to Miami, since it obviously is not possible to pension one or two products and leave the others in the soup.

"We can hardly blame the copper industry for demanding its pound of flesh, and if we proceed to give that bonus to copper then what answer may we return to gold, peanuts, lettuce, cabbage, etc., as the late Colonel Mulberry Sellers was constrained to ask? In other words, if the agencies of government are to finance one industry, why not all?

"If agricultural producers may get together and arbitrarily withhold 4,000,000 bales of cotton from the market, and collectively reduce next year's acreage by law—as some political farmers have proposed—why should not all other organizations like coal, copper, silver, gold and kindred organizations do the same thing? If the Government may guarantee a profit for one, why shouldn't it guarantee a profit for all?

"On the other hand, if the Government goes into the insurance business and becomes the super-paternalist of the age, why not quit the uncertain task of production at all and go to the treasury and help ourselves? These and countless other questions of a similar order are suggesting themselves to the mining industry as well as a thousand others, most of whom have labored long and faithfully in efforts to protect themselves from invading legislation, which the farmers have forced upon them.

"It was Lord Tennyson, we believe, who said:

'At times the small black fly upon the pane  
May seem the black ox of the distant plain!'

"The roaring mob of treasury raiders at the treasury doors remind us that the politicians of today are using such glasses as the great English author described in his epic 'To One Who Ran Down the English.' It



will be a wild time in North America when everybody quits work and lives at the expense of the Government, and it begins to look like the clock is about to strike. In the meantime what will happen to the Government?"

*Black Diamond*, Chicago, sees nothing to be alarmed at in President Coolidge's recent congressional message. Editorially, they say:

"Providing that his suggestions are not made the basis of regulatory legislative measures, there seems nothing to which exception may be taken in that part of President Coolidge's message to Congress that refers to the coal industry. He said: 'No progress appears to have been made within large areas of the bituminous coal industry toward creation of voluntary machinery by which greater assurance can be given to the public of peaceful adjustment of wage difficulties such as has been accomplished in the anthracite industry. This bituminous industry is one of primary necessity and bears a great responsibility to the nation for continuity of supplies. As the wage agreements in the unionized section of the industry expire on April 1 next, and as conflicts may result which may imperil public interests, and have for many years often called for action of the executive in protection of the public, I again recommend the passage of such legislation as will assist the executive in dealing with such emergencies through a special temporary board of conciliation and mediation and through administrative agencies for the purpose of distribution of coal and protection of the consumers of coal from profiteering. At present the executive is not only without authority to act, but is actually prohibited by law from making any expenditure to meet the emergency of a coal famine.'

"It is obviously the President's intention that legislation undertaken at this session of Congress concerning the coal industry should be limited to that which he believes necessary for handling emergencies created by strikes. Elsewhere in his message he urges that 'it would be greatly for the welfare of the country if we avoid at the present session, all commitments except those of the most pressing nature.' It is certain that the Parker and Copeland bills are within this description and should be shelved for the session or permanently.

"The President spoke the truth when he said that nothing has been done toward the creation of voluntary



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*Don't Rock the Boat*

machinery for the adjustment of wage difficulties, and it is conceivable that the public and even the industry itself may turn to the chief executive for help in the event of a deadlock next year. If he should be called upon to deal with a coal emergency, it would be better that he be given proper authority and clear understanding of the extent and limit to which he can go, than to act without those safeguards.

"In the meantime, it would be to the credit of the bituminous coal industry if it would create the machinery necessary for its own handling of wage disputes so that Government intervention would not be required."

## NON-METALLIC INDUSTRIES

(Continued from page 25)

harassed southern mills to do, and that was to turn to the West and Northwest. Most of the business here was concentrated to a moderate extent in Ohio, but principally in the States of Michigan and Wisconsin.

It is a commendable trait in the Englishman that he is never satisfied to lose business which he had had at any time. There was only one thing for him to do in the West, and that was to reduce his delivered costs. This was done by routing ships direct to Great Lakes ports via the St. Lawrence to such ports as South Haven, Mich., Manitowoc, Wis., etc. But for the fuel situation in England we would have felt this new threat more severely this year than has actually occurred.

Three of the principal producers in the South Carolina and Georgia fields have appeared before the associations of the eastern, western and southern railroads

repeatedly, but the only real cooperation obtained was in the South, the originating point of the clay, as they saw the real peril of loss of tonnage. It appears that both the eastern and western lines felt secure in maintaining the present level of freight rates north of the Ohio River and also some eastern seaboard points, and they have consistently maintained their position.

As matters now stand, clay rates are generally published on what is known as brick scale. However, the southern producers have been denied rates based on the brick scale. The matter was not passed upon by the Interstate Commerce Commission, but some slight redress is expected from the southern railroads in the proportion of the rates they receive up to the Ohio River.

This is but a slight relief, and unless further reductions are made, the possibility is that we can not market our product in the West, and as we have already been shut out of the New England territory, there will be no points of consumption left for the product of the American miners.

At this point I would respectfully suggest that the American Mining Congress, in conjunction with the southern clay producers, make a joint investigation of the situation complained of, in an attempt to ascertain beyond doubt whether the situation involves a question of lower freight rates on one hand, or increased tariff on the other, or whether a combination of both.

I will not bother you with statistics, and it will suffice to call to your attention the tremendous increase each year over the previous year of the importation of English clay at the expense of the American miner who pays his wages to Americans and purchases American equipment.

We respectfully represent, therefore, that there is no reason why we should be put permanently in a position of allowing the English to pre-empt business that we had years ago, merely because of a rate barrier which is entire unjust in character.

I am harping on the necessity of freight rate reductions because, to me, the outlook for a 50 percent increase on the import duty is highly improbable, due to the real lack of flexibility in the tariff and fully as important—the probable opposition of a certain proportion of the paper mills themselves.

Detailed description of the various means of preparing and burning powdered fuel and cost under varying conditions is given in Bureau of Mines Bulletin 217, obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a price of 20 cents. Bulletin 255, above referred to, may be obtained free of charge.



#### November Operations at Alaska Juneau Encouraging

The word "deficit" is absent from the November report of the Alaska Juneau Gold Mining Co., of Juneau, Alaska, and the more cheerful word "profit" written in its stead. Operations for the month show a profit of \$3,450. Total receipts were \$203,500 and expenses \$171,300, giving a net operating profit of \$32,200.

Other expenses, which include \$9,000 expended on the milling plant and \$2,500 on Ebner Mine development, amount to \$28,750, leaving a net profit of \$3,450.

Mill improvement has now been completed, as has also the development program at the Ebner Mine, and the company is now in an excellent situation.

#### A. S. & R. Breaks Record

According to recent press dispatches, the Garfield smelter of the American Smelting & Refining Co. in November broke all its previous records with a production of 30,000,000 pounds of blister copper. This plant is employing 1,200 men against 2,000 during the peak of capacity in World War. The greater part of this production represented smelter copper recovered from concentrates received from the Arthur and Magma plants of the Utah Copper Co., 95 percent owned by the Kennecott Copper Corporation. Practically all this copper is shipped to the Perth Amboy, N. J., refinery of American Smelting for the recovery of precious metals.

#### Federal Mining & Smelting Co. Shipments Heavier

Federal Mining & Smelting Co. reports for quarter ended October 31, 1926, net earnings of \$1,064,842 before charges for construction and equipment, depletion, depreciation and taxes. This compares with \$937,951 in preceding quarter and \$1,308,068 in quarter ended October 31, 1925. In quarter ended October 31, 1926, the company shipped 49,388 tons of ore and concentrates, compared with 43,841 tons in the preceding three months and 47,483 tons in the quarter ended October 31, 1925.

In the three months ended October 31 the low received for lead was 7.95 cents a pound, New York, and the high 8.95 cents. For silver the lowest received during the period was 51½ cents an ounce, New York, and highest was 63¾ cents. Lowest price received for zinc was 7.20 cents a pound, St. Louis, and highest 7.475 cents.

#### LARGE STOCKS OF SILVER ACCUMULATING AT SHANGHAI

The shifting of silver from the interior of China for safe-keeping in Shanghai, together with the amount of metal that is arriving from the United States, has brought the amount of silver held in Shanghai in recent months to the largest volume on record, states a report from Consul General E. S. Cunningham, at Shanghai, made public by the Department of Commerce. Bankers and brokers in Shanghai say that Chinese located in other than treaty ports are shipping money to banks in the protected districts and that much of this is being received in Shanghai.

On September 30 sycee and bars in Shanghai vaults totaled taels 80,677,000, while coined silver dollars totaled 713,500,000. The estimated value of all sycee, bars, and dollars in Shanghai was taels 132,049,000. The value at the same time a year previous was taels 99,591,000.

It is said in Shanghai that less silver is being sent from the city into the interior this year for crop movement and other commercial uses than ordinarily is the case, thus tending further to increase holdings there. As those familiar with trading in China know, it is customary for middlemen buying cotton, silk,

seed, and other products originating in rural communities to take with them silver for spot payment. Conditions unfavorable to this trade, therefore, reduce considerably the demands for silver.

From the first day of September until the last there was a continuing decline in silver. That decline was sharp enough to affect not only exchange operators, who purchase on small margin, but those dealing in merchandise. It was reported at the end of the month that several cotton firms, dealing in the manufactured article or in piece goods, had experienced losses through not covering on forward commitments.

During the latter part of the month, China was a persistent seller; while, according to reports, India bought less than Shanghai sold. It is considered possible in China that the Chinese stocks of silver will be distributed elsewhere. More than £1,000,000 of it went to London recently. The cost of moving bar silver from Shanghai to England costs, including interest, approximately 1½ percent, while charges connected with moving sycee, including assaying and refining fees, are about 2½ percent.

#### Central Eureka Issues Good Report

Facts submitted to the stockholders by President W. P. Greene show that the Central Eureka Mine, Sutter Creek, Calif., is making excellent progress. During November the company made its final payment of \$50,000 for the Old Eureka or Hetty Green Mine, which adjoins the Central Eureka on the north. The Old Eureka was acquired in 1924 for \$150,000.

The Old Eureka has been unwatered to the 1,700-foot level and pumps installed on the 500 and 1,000 foot levels. A third pump is now being installed on the 1,700-foot level and active development of this property will soon be under way. A drift is now being driven on the 1,500-foot level from the Central Eureka shaft to make connections with the main shaft of the Old Eureka and the 1,800-foot level has been extended to the south end line of the Old Eureka.

The main Central Eureka shaft has been sunk to another level, a station cut, ore and waste bins finished and drifting begun. Present production is coming from the 4,500 level, which has proved the best level so far opened up.

The company has modernized its equipment by adding an electric hoist, two large air compressors, hoist and heavy electric cables and air and water lines.

**Chile Copper Co. Bonds Oversubscribed**

Subscriptions have been received in excess of the amount of the \$35,000,000 Chile Copper Co., 25-year 5 percent gold debentures due January 1, 1947, which were offered by The National City Co. and Guaranty Co. of New York. The subscription books have been closed.

The proceeds of the issue will be applied to the redemption on April 1, 1927, of the existing 6 percent convertible collateral trust gold bonds now outstanding in the amount of \$34,990,500.

These debentures will be direct obligations of the company and will be issued under a trust agreement providing, among other things, for a sinking fund operating semi-annually after the first five years, which will retire the entire issue by maturity.

The Chile Copper Co., through the Chile Exploration Co., of which it owns all the capital stock, controls the largest known deposit of copper ore in the world. The properties are now producing at the rate of 220,000,000 pounds of copper a year, without giving effect to additional capacity about completed, which is expected to increase the aggregate capacity to more than 375,000,000 pounds.

**Nevada Consolidated Contracts for Power from Salt River Valley Water Users Association**

A contract has been signed by the Nevada Consolidated Copper Co. and the Salt River Valley Water Users' Association for the delivery of 4,000 kilowatts from the Horse Mesa Plant to the company's Ray Mines. A 12-mile, one-way transmission line will be built from the substation at Superior to Ray. This power will supplement the power generated by the steam plant at Hayden.

F. A. Reid, president of the Salt River Water Users' Association, says that construction of the Horse Mesa Plant will be completed in the early spring.

This contract is further evidence of the cooperation and interdependability of mining and agricultural interests in Arizona. It will be remembered that financing of the Horse Mesa project was greatly facilitated by the long-term contract for power to be delivered to the Inspiration Consolidated Copper Co.

**Acquires Steel Plant**

The Department of Commerce reports that the plant of the British American Steel Co., at Deschenes, Quebec, which has been idle since the war, has been purchased by McCallum Smith Co., of Montreal. This company has also bought the defunct smelter and mine plant of the British North America Co. at Nickelton, Ontario. Steps are being taken to put both plants into operation.

**Cleveland Cliffs Ships Large Tonnage**

The Cleveland Cliffs Iron Company operating on the Marquette and Menominee Iron Ranges of Michigan and on the Mesabi Iron Range of Minnesota shipped a total of 3,770,258 gross tons of iron ore from January 1 to December 1, 1926. The Jones & Laughlin Co. shipped for lake transportation in 1926 a total of 2,571,530 gross tons. Shipment of iron ore from Minnesota, including all rail shipments to December 1, totaled 5,891,510 tons. This is the fourth year in its history that the Cuyuna Range has exceeded two million tons in production.

**Michigan Mines Buy Equipment**

An electric driven skip hoist has been purchased by the Oliver Iron Mining Co., for its Geneva shaft on the Gogebic Iron Range in Michigan. The M. A. Hanna Co. is to erect a new steel head frame and completely electrify its Hiawatha Mine on the Menominee Iron Range in Michigan. They will also build new shop buildings, the work to be started immediately. Pickands-Mather & Co. have purchased a new crusher for their Volunteer Mine on the Marquette Range.

**Wisconsin Zinc Fields Active**

Zinc mining in the Wisconsin Field has been active during recent months. The Vinegar Hill Zinc Co. has been producing steadily. They have thoroughly drilled their property and a large ore body is being opened up. The company plans to increase its production. Among other producers in the district are the Badger Mine, and the Hird and Herker Mine. The Mineral Point Zinc Co., has expanded its activities and has drilled new properties with very favorable results.

**Anaconda Will Sink Shaft**

The Mountain Con Mine, at Butte, of the Anaconda Copper Co., has been closed down in order to retimber the shaft. They will install an electric hoist so that the shaft may be sunk to 5,000 feet.

**Substation Destroyed by Fire**

The Magma Copper Co., at Superior, Ariz., recently suffered a loss of approximately \$100,000 through the overheating of a transformer which destroyed the mine sub-station. Mine operation was tied up several hours.

**NEW MEXICO SITE DESIGNATED FOR POTASH EXPLORATION**

The Bureau of Mines recently announced a drilling site in southeastern New Mexico, which has been designated as fifth in order of availability for potash exploration, in the joint investigation being conducted by the Departments of the Interior and Commerce to determine the location and extent of potash deposits in the United States, with a view to the development of a domestic supply sufficient to safeguard the interests of this country. This site is in the NW. ¼ of Section 13, Township, 17 S., Range 31 E., Eddy County, N. Mex., approximately 35 miles east of Artesia. The exact site of the test may be within the quarter section specified. The site selected is on Government land, is at least a mile from any state or privately-owned lands, and is thus not affected by the clause of the enabling act which requires that leases must be negotiated by the Bureau of Mines with all owners of land or mineral rights within a radius of one mile of any proposed bore-hole before drilling operations can be commenced.

It is recommended by the Geological Survey that for this test a complete core be taken from top to bottom. This will give valuable in-

formation affecting the selection of other possible sites in this region and also bearing on the possible subsequent sinking of a shaft. The top of the potash-bearing salts should be reached at about 850 feet; the total depth recommended for drilling is 2,000 feet, which may possibly be shortened to 1,850 feet or extended to 2,300 feet, depending upon the showings of the core at the time of drilling.

In the selection of this site the following factors have been considered: Proximity to an area of favorable showings; potential value of site for future mining; favorable conditions for drilling; accessibility; fuel and water supplies; and possible further investigation of an extended area.

Announcement has previously been made of the designation of four alternative sites in central western Texas, two in Upton County and one each in Crockett and Ector Counties. These four alternative sites, being located on privately owned lands, are affected by the terms of the enabling act requiring the negotiation of leases with all land owners and holders of mineral rights within a one-mile radius.



### Colorado Mining Corporation

LaPlata Mining Company of Durango, Colo., has purchased several properties in the California district which it has consolidated under the name of this company. It is understood that they have spent a considerable amount in development work in this district in the last few months.

### Will Build Mill

According to announcement by A. W. Ellis, Manager of the E. & H. Mining Corporation of Nevada, that company will erect a new mill in the spring of 1927, in the meantime development work is being done on the property. The property has gold ore which is said to be of a profitable milling grade.

### Inspiration Ships Ore From Leaching Plant

The Inspiration Cons. Copper Co., on November 26 shipped its first carload of cathode copper from the new leaching plant to Perth Amboy, N. J. The copper will go by rail to Galveston, Tex., and from that point to New York harbor.

### Constitution M. & M. Co. Growing

The Constitution Mining and Milling Co., operating on Pine Creek in the Coeur d'Alene region of Idaho, has increased the importance of its position in the last year and is proceeding on the same lines, according to reports. It has doubled the size of the mill building and installed a ball mill unit and other equipment in the added space and extended the tunnel to the 2,500-foot point and the 200-foot level to the 2,000-foot point. It is cutting a station on the 200 where a three-compartment shaft will connect the tunnel and the 200-foot levels and where 200 feet will be sunk from the 200-foot level.

### Greene Cananea New Ore Body

Latest reports received by management of Greene Cananea Copper Co., says the Wall Street Journal, indicate discovery of new ore body in virgin territory, which was announced in a circular to stockholders a month ago, is more extensive than had been at first anticipated.

Two additional drill holes just completed and put down at widely different points have increased area of ore body materially, and have resulted in confident belief among officials that a vast ore deposit has been uncovered.

None of interests in company are willing to estimate amount of possible ore in new property. They point out that nothing fairly accurate can be said when only drill holes have been made. Extensive plans for rushing work are being made.

### United Verde Extension Enters Bisbee District

The United Verde Extension Mining Co., of Jerome, Ariz., has taken an option on the property of the Bisbee Queen Development Co., which consists of 15 full and one fractional claim which adjoin the Lone Star claim of the Warren Realty and Development Co., which latter property is now owned by the Phelps Dodge Corporation.

Exploration of the property will begin at once. M. J. Elsing, consulting engineer and geologist of Bisbee, will be in charge of the exploration work, for which approximately \$200,000 has been appropriated.

### New Concentrator at Page Mine

The new concentrator at the Page Mine, west of Kellogg, Idaho, is practically completed and is now ready for initial operation, according to information from the office of the Federal Mining and Smelting Co., Kellogg, owner of the Page group. The mill has a capacity of 250 tons daily and is fully equipped with flotation units.

The new electric equipment at the Lookout Mountain property on Pine Creek, Idaho, went into operation recently and the crosscut toward the vein on the No. 3 level will be prosecuted with all diligence. The tunnel has now been extended 600 feet and will reach its objective in 900 feet more.

### Building New Flume

The Bunker Hill & Sullivan Mining and Concentrating Co., has found it necessary to rebuild a large section of the flume down the side of a mountain near Kellogg, Idaho, from the waters of Old Milo Creek, famous for its connection with the early development of Wardner and Kellogg. The water is finding outlets before it reaches its intended destination, and the company will rebuild the section of the flume about a mile in length, virtually all the way from the intake in Wardner around the side of Haystack peak to the mills below. Work will be in charge of the engineering department of the Bunker Hill Company.

### C. & A. Gets New Mine

The Calumet and Arizona Mining Co., owner of the 85 Mine has just purchased the Cobra Negra group of claims of the Susquehanna Mining Co., and the Atwood group, both of which adjoin holdings of this company in the Lordsburg, N. Mex., district.

### West Virginia Mines Merge

A consolidation of properties in the West Virginia fields has been formed under the incorporation of the West Virginia Southern Coal Company. The value

placed upon the merging companies is something like \$4,700,000. Everett Drennan, formerly of the West Virginia Coal & Coke Co., is president of the new concern and W. H. Cunningham, formerly general manager of the West Kentucky Coal Co., is vice-president. Announcement was made early in December of the sale of \$1,350,000 bonds of the new company. The following companies are included in the merger: Marsh Fork Coal Co., Birch Fork Coal Co., Seng Creek Coal Co., Leevale Coal Co., Silush Coal Co., Vanbail Coal Co., Basic Coal Co., Burgess Branch Coal Co., and Siler and Siler. These companies produce approximately one million tons of coal annually and have an estimated reserve of 72,000,000 tons.

### Field Resigns as President Pittsburgh Coal Co.

W. K. Field, for many years president of the Pittsburgh Coal Co., has resigned. Mr. Field gave as his reasons for resigning the fact that he has been in ill health and that the position as head of the Pittsburgh Coal Co. is a strenuous one and too much of a burden for him to carry. Dr. L. E. Young, general manager of the Union Collieries Co., St. Louis, Mo., has accepted the offer of the Pittsburgh Coal Co. as general manager in charge of operations, his work to begin January 1.

### Mine Transfer

The Alabama By-Product Corporation has acquired the Barney Mines of the Barney Coal Co., in Walker County, Alabama. These mines are now producing 350 tons per day but the new owner plans to increase the output.

### Illinois Output Low

According to A. D. Lewis of the State Department of Mines and Minerals for Illinois, that state produced less coal in 1926 than in 1925. The report shows that 59,810 men were employed in October, 1926, averaging 18.5 working days for the month.

### Indiana Mine Opens

After suspending operation for many months the Bickett Shirkie Mine No. 2, near Terre Haute, Ind., has announced reopening. A number of men are already at work and coal is being hoisted. This property is one of the largest mines in this territory. According to recent reports only a few of the large mines in this field now remain idle.

### Coal Companies Merge

The Corporation Bureau of the Department of State and Finance has approved the merger of the Pine Hill Collieries Co., formerly the Pine Coal Corporation, and the Ekram Coal Co., formerly the Markle Coal Corporation. The merged company is known as the Pine Hill Collieries Co.

The company has a capital stock consisting of 30,521 shares of common with a par value of \$1 a share, and 25,000 shares of preferred stock at a par of \$100 a share.

The officers of the merged company are: James Crosby Brown, of Philadelphia, president; G. R. Radford, of Bethlehem, treasurer; and Elmer L. Mack, Bethlehem, secretary.

### Indiana Coal Production Higher

A. C. Dally, Chief Mine Inspector for Indiana, in a statement covering the fiscal year ending September 30, 1926, states that a total of 18,560,149 tons of coal was mined in Indiana as against 17,693,409 tons for 1925. Employees received a total wage of \$28,644,657 during 1925, as against \$28,250,355 during 1926. Seventeen thousand eight hundred ninety-seven men were employed in the major mines of the state, which is approximately 2,000 less men employed than in 1925.

### Coal Leases at Public Auction

The Interior Department will lease at public auction two tracts of public coal lands in Gunnison County, Colo., on petition of Edward W. Genter. One comprises 640 acres, the lease to which will require payment to the Government of a royalty of 25 cents per ton on coal mined, a minimum investment of \$50,000 during the first three years of the lease, and a minimum production of 30,000 tons a year beginning with the fourth year of the lease. The other tract includes 40 acres, the lease to which will require the payment of a royalty of 25 cents per ton for coal mined, a minimum investment of \$5,000 and a minimum production of 2,000 tons a year.

### Coal Companies Merge

The Cuyahoga Coal Co. has purchased the Lakeside Fuel Co., which creates one of the largest companies of its kind. The merger plans an annual tonnage of 300,000 tons and will operate six yards located at various points in the city of Cleveland. The capital stock of the company has been increased to \$500,000.

### GEOLOGICAL SURVEY MAKES ANNUAL REPORT

Cooperation with the oil industry in an effort to recover a larger part of oil already found and to discover new oil fields featured the work of the Geological Survey for the past fiscal year, according to the annual report of the Director.

The report also announced that a change of policy in the technical administration of oil and gas, coal and other leases on the public domain was effected during the year by giving more authority to the Bureau's field officers in the handling of technical questions. Operators on Government lands were thus relieved from vexatious delays that might involve heavy expenses.

Large savings in the cost of ground surveys of areas in which the use of aerial photography was adopted through cooperation with the United States Army Air Service resulted in the Geological Survey's topographic mapping program, the report stated. Approximately 7,500 square miles have been photographed, this new aid supplementing but not supplanting ground surveys. Aerial photographic surveys in southeastern Alaska were conducted

by an expedition of the Bureau of Aeronautics of the Navy at the request of the Geological Survey indorsed by other bureaus needing maps of this region.

Pointing out that an increase of 25 percent in the map sales had occurred in the last six years, the report calls attention to the fact that the Geological Survey's map-making plant had an appropriation of \$105,000 for engraving and printing topographic and geological maps and is to be credited with \$48,251.36 turned into the Treasury during the year for sales of maps and transfers. Ten years ago, with a slightly larger appropriation, the miscellaneous receipts from this source were \$30,369.35. This year more than 630,000 maps were sold.

The report also records a vast amount of work performed in the topographic and geologic mapping of different parts of the United States and Alaska, in chemical analysis, in stream measurements and surveys of the power and irrigation value of many rivers, in classifying and leasing the public lands, and in the distribution of maps and book publications.

### Conference on Classification of Coals

A conference on the subject of coal classification was held in Pittsburgh, November 17. The large consumers, government officers, producers, and distributors of coal being represented. It was the opinion of the conference that some steps looking to classification of coals should be taken. The following resolution was adopted:

"That there should be set up a thoroughly represented sectional committee to develop a plan for the classification of coals based upon such chemical and physical characteristics as would make the plan most readily adaptable to industrial and commercial use on a nationwide scale; that the plan should include all classes of coal from anthracite to lignite; that it be recommended that in the development of the work international cooperation be sought especially with Canada, and that a small organization committee be appointed by the chair."

The committee appointed by the chair is composed of the following: H. N. Eavenson, Chairman (AIME); F. R. Wadleigh, (ASME); W. H. Fulweiler, (ASTM); Geo. H. Ashley, (Coal Mining Institute); A. C. Fieldner, (Bureau of Mines); M. R. Campbell, (Geological Survey).

### Anthracite Exhibit Wins Appreciation

The Anthracite Bureau of Information says:

"Although the Sesquicentennial in Philadelphia closed at the end of November, there continues to be favorable mention of the anthracite exhibit as one of the outstanding educational features of the fair.

"There were seven main features in the exhibit, and it was all under the direction of Mr. William Auman, of the Anthracite Coal Service staff. Mr. Auman, as an engineer with wide experience in actual operation, by reason of special knowledge and ability to impart it to visitors aided greatly in making the display of the coal industry a success.

"The most impressive of the seven features in the anthracite section, as far as the visiting public expressed itself, was the miniature breaker, which is an exact model of the Marvine breaker of The Hudson Coal Co., and which was placed on display by the courtesy of Mr. W. H. Williams, president of The Hudson Coal Co. It was set up by Hudson Co. men, and representatives of that company were continuously on hand during open hours to explain its workings

to the public. The model breaker demonstrates everything, from the dumping of the mine-run coal into the main rolls, to its passage over shakers and through jigs, and thence into the pockets.

"The remaining features of the display were a miniature mine car loaded with a typical mine-run load of coal, rock, bone and dirt; a show-case displaying the quantities and proportions of sized coal recovered from such a car, together with the dirt and other refuse taken out; a set of modern coal distributing pockets, such as up-to-date retailers use; three cubes of coal showing the exact proportions of coal produced in the anthracite mines in the century ended in 1926, the cubes representing exactly the amount of anthracite extracted for each tenth of a second of elapsed time in 1826, 1876 and 1926; a large block of coal showing how bone and refuse are found intermingled with pure fuel in most of the remaining coal beds; and a long panoramic view of the Mahanoy Valley. This view was supplemented by eight oil paintings of typical coal industry subjects, from the breaker itself, and mine workers at different occupations, to the weighing of coal on the railroad scales, and the dumping of cars at the docks in New York Harbor."

#### Coal Briquets Exempt from State Tax

Coal briquets are exempt from the Pennsylvania anthracite tax, the Dauphin County Court has ruled in an opinion handed down this week.

President Judge William M. Hargest ruled that briquets are manufactured from the culm of anthracite, and as a manufactured product are exempt from taxation. The decision was given as a result of an appeal to the court by the American Briquet Co., of Lykens, from the coal tax assessment placed upon it by the auditor general's department.

The department held that the briquets, being anthracite, are subject to the same state tax as anthracite itself. The court ruled that the patent fuel did not appear on the market until after the enactment of the tax law, and, therefore, is not a taxable commodity.

#### Coal Bill

The House Committee on Interstate Commerce will take up the Parker coal-control bill on January 11 and consider it until the measure is disposed of. Opposition to the measure is growing among members of Congress. Representative Wyant (Rep., Pa.), a member of the committee, is particularly active in the opposition. He refers to the fact that the bill does not provide fact-finding for fuel oil notwithstanding that product has displaced the use of more than 100,000,000 tons of bituminous annually. Referring to the provision which

war-time control by the President over the coal industry, Mr. Wyant says: "I am opposed to giving the President power to declare an emergency in any industry when he conceives the possibility of a strike. I believe the people are becoming impatient with this constant attempt of the Government to encroach upon legitimate rights of business. We are regaining a coal consciousness; and the representatives of 28 coal states are determined to keep the coal industry free from Government management."

A decision by Commissioner Paul W. Houck in the case of W. F. Humbert, Tower City, against the Philadelphia and Reading Coal & Iron Co., holds that the claimant is entitled to compensation. The referee awarded compensation to the claimant and the award had been affirmed by the compensation board. The company then appealed to the Court of Common Pleas of Schuylkill County and the court remitted the record to the board for more specific findings of fact.

A new hearing was held and the company offered some additional testimony. In summing up the findings of fact, the commissioner also went into the question of property and premises as discussed in the prior case.

"The path on which the claimant fell," the opinion states, "is not and never was maintained by the defendant company, but the surrounding property is premises of the defendant company, occupied by and under the control of the defendant, and on which its business was carried on. The claimant's presence on these premises was required by the nature of his employment, and his injury was caused by the condition of the premises."

It is therefore held that as the path on which the claimant fell is part of the premises of the defendant, the claimant was in the course of his employment at the time of the accident.

#### Stream Pollution

Surgeon General Cummings of the Public Health Service in referring to its study of health hazards in industry, told the House Appropriations Committee that coal dust is not conducive to tuberculosis.

His department has encouraged Ohio, Pennsylvania, West Virginia and Maryland to agree on a system of mutual control of pollution of streams by oil and wastes from mines and steel mills below Pittsburgh. He said:

"They agree on a mutual control of stream pollution. For instance, some of the cities in Ohio, including East Liverpool and Steubenville, below Pittsburgh, have had a great deal of trouble with waste from Pittsburgh, and from the Pennsylvania mines, steel mills, and oil

wells. There has been a mutual concession with respect to the control by both sides up there."

Next year the service expects to conduct stream pollution investigations at a cost of \$49,000.

In a report on sanitary control of ground water supplies, the Service states that disease epidemics have occurred at Bethlehem Mines, W. Va., because of defects in ground water supply. It is stated that many mines furnish water for municipal supplies. It notes that there have been cases of mine water being used without treatment from parts of a mine being worked. It is stated that very few mines are equipped with sanitary facilities, with the result that the mine water is badly contaminated, serious pollution having occurred from this defect at Flat River, Mo. As safeguards for the water supply the service recommends adequate purification, or treatment; coagulation, filtration, or chlorination. Due to the consistently low turbidity of mine water, the service states that pressure filters with a brief period of coagulation will often suffice.

Reference is made to the flooding of special water supply drifts with general mine drainage. Safe supplies are often obtained from isolated unused drifts which are closed off from the rest of the mine by suitable bulkheads. Unless the bulkhead is water-tight the drift is sometimes flooded with general mine drainage due to a shut down to repair pumps, resulting in contamination of the normally safe supply. The service says water-tight concrete bulkheads should be constructed, providing a water-tight man-hole opening if necessary. "Water from mines subject to contamination or pollution requires adequate purification or treatment to make a safe supply," says the service in giving a code of principles on sanitary control of ground water. "Special water supply drifts located in mines should be protected from flooding and drainage from working shafts and drifts."

#### Decree on Mine Drainage

A decree issued December 1, by Judge McPherson of Fayette County, Pa., with respect to stream pollution involves five Pennsylvania coal companies who are defendants in litigation relative to the draining of mine water into Indian Creek. These companies were given to June 1 to turn the drainage into other channels. The defendant companies are: Sagamore Coal Co., Melcroft Coal Co., Indian Creek Coal & Coke Co., Romey Coal Mining Co., and Nebo Coal Mining Co. The decree provides that the flumes and entire drainage tunnel system now under construction for carrying mine water to a point below the dam of the Mountain Water Supply Co., shall be



completed and in operation not later than June 1, 1927. The Coal companies believe that this construction will be completed early in May, 1927.

#### Rate Case Postponed

The Interstate Commerce Commission hearing involving coal rates from Kentucky and Tennessee to points in Tennessee and Georgia has been postponed from December 6 and reassigned to January 6, 1927.

#### Oddie Urges Funds for Mining Economics

Senator Tasker L. Oddie, Chairman of the Committee on Mines and Mining, is asking special assistance for the U. S. Bureau of Mines through an appropriation of \$100,000 to be spent in a study of mine economics. Senator Oddie, in a statement said, that there has long been need for Federal studies dealing with the business side of mining.

#### War Minerals Claims Settled

Secretary of Interior Work has submitted to Congress a final report on settlement of war mineral claims. Of the appropriation of \$8,500,000 for this purpose all but \$962,406 has been expended. The Treasury is withholding payment of a claim of \$97,889 pending settlement of a claim of another Government agency against the war mineral claimant. Awards to the amount of \$7,012,249 were paid to claimants and expenses of administering the act amounted to \$528,964. Secretary Work says that while all claims have been definitely disposed of by the department, objections have been made to awards in eight claims in which suits are pending in the courts. These suits are being resisted by the department on the ground that the decision of the department was proper and reasonable. Secretary Work says the department has dealt liberally with claimants, granting them a full measure of relief in every case. He regards all claims as closed unless future court action should require other or additional consideration.

#### Rivers and Harbors

The Senate passed the bill making appropriations for improvements of rivers and harbors, and as it has passed the House it will go to conference to adjust Senate amendments. Among amendments adopted by the Senate was one for a 22-foot channel in Sandusky Harbor, in the interest of coal transportation. The Pennsylvania Railroad, which has built two modern coal-handling plants at Sandusky, provides, through its connections, the most direct routes from mines in Virginia, West Virginia, and Kentucky to upper lake ports. The present inadequate channel depth has

#### CANADIAN TARIFF BOARD TO HOLD HEARINGS IN JANUARY

The Canadian tariff advisory board has announced that a public sitting will be held on January 18, in connection with an application for the imposition of duties on anthracite screenings for steam purposes, and on coke for metallurgical foundry and domestic uses, and for the abolition of the drawback now granted on coal imported by operators of by-products coke ovens, according to advices to the Department of Commerce from Assistant Trade Commissioner O. B. North, Ottawa.

Under the present Canadian tariff, anthracite coal screenings and coke are free of duty, and a drawback of 99 percent of the duty is granted on bituminous coal imported by operators of by-products coke ovens. Hearings for an increase in the duty on bituminous coal will be held later.

In order that all persons interested may have the fullest opportunity to place their views before the advisory board, further public hearings will be held on January 19 and 20 on applications for increase in duties on candles, corn, and corn syrups; for the removal of reduction of the duties on "oil tops" (certain refined petroleum products) and tops for gloves; for a modification of the present tariff status of objects of art; and for a duty on tin blocks, pigs, or bars.

added to the cost of transporting coal as the large lake carriers are compelled to unload as much as 10 percent of their cargo in order to navigate the channel, according to a report of the War Department.

Senator McKellar (Dem., Tenn.), introduced and the Senate rejected an amendment to the bill providing for a combined river and power system by the Government in the Cumberland River above Nashville in place of proposed locks and dams numbered 9 to 17.

#### Mine Regulations

The Department of Commerce announces that persons holding titles to mines in Panama must file with the Secretary of Agriculture and Public Works, before January 1, information covering a duly legalized title, proof that the title has been properly registered, proof of payment of annual tax required by the fiscal code, and proof of payment according to Article 63 of Law 88, 1904.

#### Seeks Elimination of Royalty Tax on Minnesota Ore

A drive to eliminate occupational and royalty taxes on Minnesota iron ores, provided the ore is made into finished products within the boundary of the state, has been launched by W. S. MacCormack, Duluth finance commissioner. He will seek the support of the state legislature to have such a bill passed at the session next month. The commissioner believes those taxes are holding back development of iron-mining industry, and he feels their elimination under the condition outlined would prove a boon to Duluth. He contends United States Steel Corporation would be encouraged to turn a larger proportion of its iron ores into finished products at Minnesota Steel Co.'s plant at Duluth where occupational and royalty taxes eliminated on ores treated at its furnaces here.

#### Hearings on School Land Grants

Secretary of Interior Work opposed before the House Rules Committee the bill reported by the House Public Lands Committee granting school lands to western states with authority by them to issue prospecting permits and leases for minerals. Secretary Work favored instead a law granting to states title to one, two, or four sections in a township inclusive of minerals. The bill should provide that additional grants shall not apply to school sections in place, covered by valid claims or right, initiated under existing public-land laws. The bill should not grant to states title to sections in existing reservations of the United States and should not grant to states minerals in lands selected as indemnity, or lands selected under other state grants than those for the support of schools.

"Disposal of school lands containing minerals, heretofore passed to states, at a nominal price, suggests in the interest of conservation, and continuing income, that these minerals be subject to lease by states and not sold away from the schools," said Secretary Work.

The committee requested the Secretary to prepare a bill embodying these suggestions which will be substituted for the bill of the Public Lands Committee and reported to the House for enactment.

#### Upholds State Mining Laws

The Supreme Court of the State of Colorado has upheld the validity of the Colorado Coal Mine Inspection Laws declaring that the state has through police powers the right to enact legislation safeguarding life and property in coal mines without violating the fourteenth amendment to the Constitution. The decision affects more than 100 small mines which must be closed down until they comply with the state's inspection laws.

### Trade Practice

In its annual report the Federal Trade Commission says that actions on applications for trade practice conferences for the steel, platinum alloys, and zinc-product industries are awaiting preliminary inquiry and report.

Copper, cement, phosphate, rock, sulphur, soda pulp, and alkali exported by Webb law associations last year totalled 1,400,000 tons, valued at \$57,000,000.

Complaints against American importers and exporters investigated by the commission covered soldering iron from Germany, oil engines to Japan, and steel products to China.

### Land Office Issues Decisions

The General Land Office has rendered the following decisions:

The provision in section 1 of the act of July 17, 1914, which limits a desert entry made under that act to 160 acres, has reference only to lands withdrawn, classified, or valuable for one or more of the minerals named therein, and it does not preclude inclusion within such an entry of other lands, nonmineral in character, which, together with the mineral lands, exceed in the aggregate 160 acres. A railroad right of way granted pursuant to the act of March 3, 1875, conferred upon the grantee a limited fee, subject to an implied condition of reverter should the land cease to be used or retained for the purposes for which granted, and none of the land therein is subject to location and appropriation under the mining laws while the grant remains in effect.

Lands, although containing deposits of mineral, will be considered as non-mineral in character where the cost of extracting is shown to be so large that a prudent man would not be warranted in expending his time and money thereupon in the reasonable expectation of success in developing a paying mine.

The land office will open to entry on April 1 at the Billings, Mont., land office, 160 acres of land in Powder River County, Mont., which have been classified as coal land. On March 22 at the Elko (Nev.) Land Office, 22,441 acres in White Pine County, will be open to entry. The land is reported to be adapted to mining. On March 29 at the Salt Lake Land Office, 16,623 acres in Wasatch County, Utah, will be opened to entry. The area is classed as oil shale land, in which there are several patented mining claims. On March 22 at the Salt Lake Land Office, 1,000 acres in Kane County, Utah, which have been classified as coal land, will be open to entry.

### Helium Development

The bill of Representative Frothingham (Rep., Mass.), (H. R. 15344), amending the law for production of helium by the Bureau of Mines, authorizes the furnishing of helium to aid scientific and commercial development. It also places this act under the general supervision of the Department of Commerce, in which the Bureau of Mines is now located, as the original act of March 3, 1925, placed it under supervision of the Interior Department, in which the bureau was then located.

### Silver Purchase

According to testimony of Director Grant of the Mint Service before the House Committee on Appropriations, the refining departments of the mints are three years behind in their work, on account of the increasing demand for small coins and for gold as reserves for certificates. The mints have yet to coin 4,900,000 silver dollars from silver purchased at \$1 per ounce under the Pittman act.

Director Grant said the San Francisco mint is three or four years behind in its refining operations. The mint will coin \$20 gold pieces till June. He said silver held by the Government should be refined, and that no purchases of silver are now required.

Director Grant did not agree with the Budget Bureau in recommending abandonment of the mint at Carson City, Nev. The basis of the budget recommendation was that the Carson mint is near enough to San Francisco to permit the California mint to handle the business, and also that there is a proposal to convert the Carson mint into a prison. Director Grant said it was just as necessary to continue the Carson mint as to continue the Salt Lake and Boise assay offices. He said that at the Carson mint last year \$297,000 worth of bullion was purchased as compared with \$171,000 worth at Boise and \$58,000 worth at Salt Lake. Last year the Carson mint bought twice as much gold as the year before, a total of 297,000 ounces. He said there is quite a mining country around Carson, which produces considerable gold. The Carson mint is now used as an assay office and could be transferred to the post office building at Carson.

Referring to wastage at mints, Director Grant said some of the metals are wasted in vapor, stating that gold vaporizes.

Director Grant recommended continuance of the New Orleans mint for the present. It receives bullion from South America and stores silver dollars. Director Grant said the demand for smaller coins is increasing. Referring to the

difficulty in securing employees, Director Grant said New York street sweepers get \$6.10 per day while the New York assay office pays men \$4.50 for handling gold.

In recommending continuance of the Boise assay office, Mr. Grant said there is quite a mining country in that vicinity and the office helps the miner.

In recommending discontinuance of the Deadwood assay office, Director Grant stated that one company owns all the mining country around Deadwood and ships its ore direct to Denver.

Director Grant said the Helena assay office is of value to the miners, as there is quite a mining country in that vicinity, with gold mining and prospecting going on all the time.

The House defeated an amendment by Representative Williamson (Rep. S. Dak.), to continue the Deadwood assay office. He said the appropriation for maintaining the office has not been sufficient for a dozen years to enable it to buy gold mined in that vicinity, and that large producers have been compelled to send their bullion to Denver or New York. He said the office serves the prospectors, miners, and discoverers of ores in analyzing their samples and making assays. Representatives Madden and Byrns favored discontinuance of the office, Mr. Madden stating that the Director of the Mint had advised that there is no reason to continue it.

### Alaskan Mineral Possibilities

Director Smith, of the Geological Survey, told the House Committee on Appropriations that surveys by it may reveal copper and oil near Mt. Spurr in Alaska. His organization is making a general survey of recent mining developments, especially in gold mining centers adjacent to the Alaskan Railroad and of copper camps in the Copper River region. Next year a survey will be made of Kodiak Island which has promise of revealing valuable deposits, because gold placers have been mined along the coast. Surveys will be made of coal-bearing rocks between Kotzebue Sound and Koyukuk River, and in the Bering River coal field, and the Yakataga and Katala oil field.

The Alaskan Railroad has placed in use a gasoline motor car whose operation costs 40 cents per mile as compared with \$1.40 for steam-train operation.

The railroad officials requested \$40,000 to construct spur tracks to connect with bituminous mines in Alaska. They stated that the Ross Hecky mine will soon sell blacksmith coal on the Pacific coast, whose supply is now received from eastern states. It is also expected that cannel coal from Healey River will be sold in San Francisco.

The Department of Mines and Mining of the Sacramento Chamber of Commerce is planning to have the largest mineral display ever shown in California arranged for the 1927 state fair in that city. Arrangements have been made with the directors of the State Agricultural Society for approximately one-half of the space of the second floor of the new fireproof grandstand structure for this display. The display will be arranged by counties, so as to permit each county to maintain its individuality and compete for handsome prizes. The exhibits will include metallic ores and manufactured products, non-metallic ores, gems and rare minerals, fuels, models of mining machinery and working models, cross-section models of mines, model oil derricks and photographs of mining in all its phases. Plans are being made for the showing of motion pictures of the mining industry, which are expected to attract wide attention. Those interested in the mining machinery are invited to make application for space in this display, and for this purpose should communicate with the Department of Mines and Mining of Sacramento Chamber of Commerce.

#### Garvey Again Heads New River Association

M. L. Garvey, General Manager, Maryland New River Coal Co., Winona, W. Va., was reelected President of the New River Coal Operators' Association, at the annual meeting held at Mt. Hope, W. Va., along with Wm. McKell, President, Willis Branch Coal Co., Glen Jean, W. Va., Vice-President, and P. M. Snyder, Vice-President, East Gulf Coal Co., Mt. Hope, Treasurer, who with S. A. Scott, Vice-President, New River Co., MacDonald, W. Va.; R. E. Taggart, Vice-President, Stonega Coke and Coal Co., Big Stone Gap, Va.; Ernest Chilson, General Manager, Raleigh Coal and Coke Co., Raleigh, W. Va.; and G. H. Caperton, President, New River Coal Co., Charleston, W. Va., constitute the Executive Committee. Stanley C. Higgins continues as Secretary.

There was a good attendance at the meeting and Mr. Higgins' report showed the Association to be on the up-grade both as to membership and financial reserves. A luncheon was served at the Y. M. C. A., after which talks were made by R. M. Lambie, Chief Mine Inspector of West Virginia; Holly Stover, of the Stover Smokeless Coal Bureau, and Executive Secretary Gandy of the National Coal Association. Mr. Lambie suggested that a committee be appointed to meet with the deputy mine inspectors of that district on the 15th of each month to carefully discuss the mine accidents of the month previous in a studied effort to take such steps as might elim-

inate as many accidents as possible in the future. Mr. Lambie's proposal met with a hearty response by New River operators and such a committee will be appointed.

#### Page Elected President Smokeless Association

Major L. Rodman Page, Jr., of the Crozer Coal and Coke Co., Philadelphia, Pa., was elected president of the Smokeless Coal Operators' Association of West Virginia, to succeed W. B. Ord, at the recent meeting of the association held at the Waldorf-Astoria Hotel, New York City. The following officers were elected:

W. P. Tams, Jr., First Vice-President; John L. Steinbugler, Second Vice-President; G. H. Caperton, Treasurer; E. J. McVann, Secretary. The following directors were also elected: G. H. Caperton, President, New River Coal Co., Charleston, W. Va.; Otis Mouser, President, Stonega Coke and Coal Co., Philadelphia; O. L. Alexander, Vice-President, Pocahontas Fuel Co.; Wm. C. Atwater, President, W. C. Atwater & Co.; John T. Wilson, Vice-President, Warrior Coal Co.; G. J. Francis, Vice-President, Pond Creek Pocahontas Co.; P. N. Snyder,

also discussed this subject with particular reference to the process used by the Hydrotator Co. H. B. Cooley, of Allen & Garcia, of Chicago, read a paper on coal preparation. Eugene McAuliffe presented a paper on "How the Coal Industry can Help Itself." Mine operation from the standpoint of safety was also a topic discussed, papers being presented by William Carson and F. Carson, mine superintendent and manager of the New Zealand Coal & Oil Co., Kaitangata, New Zealand, on "Spontaneous Combustion and Fires in Coal Mines." This paper was presented by and commented upon by Professor Chedsey, of Pennsylvania State College. Among other speakers on this subject were John T. Ryan, Mine Safety Appliances Co.; State Mine Inspector Richard Maize, J. W. Paul, United States Bureau of Mines; George Groves, United States Bureau of Mines; R. N. Hosler, Pennsylvania Compensation A. & I. Bureau; W. L. Affelder, Hillman Coal & Coke Co.; A. R. Pollack, of the Ford Collieries Co.; George S. Rice, United States Bureau of Mines, and others.

Vice-President, East Gulf Coal Co., and W. A. Richards, Majestic Collieries Co.

At a luncheon held at the Waldorf-Astoria during the meeting, brief talks were made by State Senator E. W. Goss, W. J. Harahan, Harry L. Gandy, and James F. Callbreath.

#### Union Calls Meeting

The United Mine Workers of America have called a bituminous coal convention for January 25, 1927, at which it is understood wage demands for union miners in the central competitive field will be formulated for presentation by the scale committee to the operators' scale committee which meets at Miami, Fla., February 14, 1927.

#### Capital in Mining Industries

According to statistics made public by the Bureau of Internal Revenue the fair value of the capital stock of all mining corporations making returns in 1924 was \$7,483,691,440. The report shows the capital invested in the coal industry amounting to \$1,852,751,471. In metal mining \$1,331,783,527. In oil and gas \$2,889,830,113. In non-metals \$86,790,753. In quarrying \$204,634,738. In all other mining \$1,617,900,838.

#### COAL MINING INSTITUTE HOLDS ANNUAL CONVENTION

Coal preparation received one full day's attention at the recent meeting of the Coal Mining Institute of America held at Pittsburgh, Pa. The Roberts & Schaefer Co.'s process of dry cleaning, the Rheolaveur process of washing, the Hydrotator and the Chance Coal Cleaning systems were thoroughly described. J. J. Rutledge, state mining engineer and head of the Maryland Bureau of Mines, was elected president. E. R. Johns, general superintendent, Bethlehem Steel Corp., coal mines, first vice president; J. W. Paul, United States Bureau of Mines, second vice president, and W. H. Howarth, state mine inspector, third vice president. H. D. Mason was reelected as secretary treasurer and the following were elected as board of director: Nicholas Evans, A. R. Pollock, W. H. Allport, C. B. Byrne, G. W. Riggs, D. D. Dodge, W. C. Hood, Cadwalader Evans, William Nesbitt and James Walker. The next annual meeting of the institute will be held the first week in December.

Dean E. A. Holbrook, of the School of Mines of Pennsylvania State College, discussed the problems of coal preparation. Dever C. Ashmead



### World's Production of Gold

The estimated value of the gold produced in the world from 1860 to 1924, inclusive, was \$15,081,683,600, states J. P. Dunlop in a report recently issued by the Bureau of Mines. In 1924 the estimated production of the world was \$389,169,700, an increase of \$21,316,300 over that of 1923. This increase followed a period of successive annual decreases from 1915 to 1922, and an increase of \$48,433,300 in 1923. The production in 1924 in the United States increased \$543,000. In Africa the increase was \$9,276,300, or 44 percent of the total increase in world output. The production in Canada increased about \$6,000,000, or 24 percent. The large increase in the Rand mines in South Africa was due to the absence of labor troubles and to the steady working of the mines all the year.

### Small Mines Produce Much Gold

In addition to the output of gold by large operators, more than \$20,000,000 worth of the metal was recovered in 1924 in the United States from about 3,100 placer and deep mines, many of which produced between \$100,000 and \$300,000 each. Hundreds of mines, especially placer properties in California, Oregon, Idaho, Alaska, Arizona, and the Appalachian states, produced very small quantities of gold, and the average value of output of the smaller mines was about \$6,700.

### World's Production of Silver

The figures for the world's production of silver in 1924 show that the United States and Canada produced 36 percent of the total, against 37 percent in 1923, according to a news release of the Bureau of Mines. Mexico, Central America, and South America produced 50 percent, so that only 14 percent (33,092,300 ounces) came from all other countries, mainly from Australasia, Burma, Germany, Japan, Spain, and Dutch East Indies. The total decrease in the world's production was 6,942,770 ounces. The average monthly open-market price ranged from \$0.63781 per ounce to \$0.71168. The value of the silver produced in the world in 1924, at \$0.67 a fine ounce, was about \$160,175,800, and the total value from 1860 to 1924, inclusive, was \$6,560,247,400. Most of the world's output of silver is produced or refined in the United States, but a large part of it is consumed in Great Britain, India, and China, and the price of silver has been dominated by the London market.

Prices of silver in foreign countries were higher in 1924 than in 1923, and it is estimated that European coinage absorbed 45,000,000 to 50,000,000 ounces of silver. The quantity of silver supplied from the remelting of old coinage and by debasement of new issues was

### COAL STANDARDS

The Division of Simplified Practice of the Department of Commerce is expected to take up the matter of standardizing and reducing the number of sizes of bituminous. R. M. Hudson, chief of the division, says standardization of sizes will eliminate waste in production. He states that if the present 20 sizes should be reduced to five or six, the necessity for tippie equipment would be eliminated and consumers would be guaranteed standard size specifications.

only about one-half as much in 1924 as in 1923. The total quantity of silver used in the arts and manufactures was only a little less than in 1923. The use of silver in the photographic and chemical industries increased about 10 percent. The exports of silver to China in 1924 were much less than in 1923 and stocks of silver accumulated there owing to disturbed political conditions, causing stagnation of trade. Fortunately agricultural conditions in India were excellent and unusually large quantities of silver were exported there in settlement of foreign balances. Conditions in China and India were unchanged in the early part of 1925, so that the market for silver has been very stable. In 1925 the efforts of European countries to stabilize their currencies by the issue of subsidiary silver coinage led to absorption of large quantities of silver. With this condition and no large increase in silver production probable, silver should benefit by the gradual restoration of world trade, though India and China still remain the controlling factors in the consumption of silver bullion.

### Antimony in United States

Occurrences of antimony in the United States are many, but there are few localities from which an important tonnage could be produced at any prices heretofore reached, states the Bureau of Mines. The states that have produced antimony are Alaska, Arizona, Arkansas, California, Idaho, Nevada, Oregon, Utah, and Washington.

In the past, almost invariably when the price has exceeded 20 cents a pound sporadic production has appeared but has never furnished more than a few percent of the domestic consumption. This country is dependent upon foreign sources for its supply.

The United States, France, Germany, and Great Britain normally consume 85 percent of the world's output of antimony. Of these countries France has been the most nearly independent of foreign sources. China furnishes nearly

90 percent of the world's production, but consumes domestically only a small percentage of what she produces. The major sources of the world's supply are China, France, Bolivia, Mexico, Australia, Czechoslovakia, and Indo-China. The minor sources are Canada, Peru, Spain, Portugal, Siberia, Algeria, British South Africa, Japan, India, and Borneo.

### Large Production of Cadmium in 1925

More metallic cadmium was produced in the United States in 1925 than in any other year since its isolation began in this country in 1906, according to reports made by producers of cadmium to the Bureau of Mines. The production at six plants amounted to 502,824 pounds, valued at \$276,553, at the average selling price of 55 cents a pound, based on total sales by producers. The market quotation on American metal in New York remained at 60 cents a pound until early summer when it dropped to 50 cents a pound for a short time, rising again to the earlier level.

The following table shows the number of pounds of metallic cadmium produced in and imported into the United States from 1921 to 1925:

	Produced		Imported for consumption	
	Quantity (pounds)	Value	Quantity (pounds)	Value
1921 .....	68,501	\$67,131	101	\$216
1922 .....	131,590	143,433	2,240	2,434
1923 .....	183,816	161,758	16	119
1924 .....	129,328	77,697	1,102	743
1925 .....	502,824	276,553	5	6

Probably the most important recent developments in the use of cadmium are in the plating industry and in the manufacture of cadmium-lithopone.

### Alaska Mineral Production

Mines in Alaska produced \$17,490,000 worth of minerals during the year 1926, as compared with \$18,220,692 during 1925, according to estimates by the Interior Department.

Based on surveys of the mineral resources of Alaska by the Geological Survey the figures show that the amount of gold produced in Alaska increased during 1926 over 1925. The gold output in Alaska in 1926 was estimated at \$6,620,000 and was \$6,360,281 in 1925.

Production of Alaskan copper in 1926 showed a loss. The amount produced in 1926 was approximately \$9,500,000 as compared with \$10,361,336 in 1925. The output of silver decreased from \$482,495 in 1925 to \$420,000 in 1926, while coal production in Alaska practically held its own in 1926. Other metals, including lead, petroleum, marble, tin, and platinum are estimated at \$550,000 in 1926, a decrease over 1925 production, which amounted to \$611,963. The total value of the mineral output of Alaska since 1880 amounts to over \$570,000,000.

### Mine Inspectors Get Assignments

The seven mine inspectors for the anthracite regions of Pennsylvania recently appointed by Governor Pinchot, have been assigned to duty by Secretary of Mines Joseph Walsh. The assignments, which may be temporary, are as follows:

Bert Golden—Seventh District, headquarters Taylor. Augustus McDade, the present inspector, has been transferred to the 4th District at Scranton. The change to take place December 16, 1926.

John L. Picton—Fourteenth District, headquarters Nanticoke. To take effect December 16, 1926.

Wm. J. Clements—Seventeenth District, headquarters Lansford. To take effect December 6, 1926.

Timothy A. Ryan—Eighteenth District, headquarters Coaldale. To take effect December 6, 1926.

Wm. R. Bottomley—Twenty-first District, headquarters Shenandoah. To take effect December 6, 1926.

James Quigley—Twenty-second District, headquarters Centralia. To take effect December 16, 1926.

Charles G. Fromme—Nineteenth District, headquarters Pottsville. To take effect December 6, 1926.

Although the appointments are made after examination, the Senate must confirm the inspectors if they are to hold office. All executive appointments are only for the period ending with the close of the next session of the state senate, if made between sessions.

Governor Pinchot will forward the nominations to the Senate just before his administration closes next month. There is nothing to indicate that there may be rejections on the part of the Senate, but there is nothing binding upon the next administration to accept this administration's appointees.

Secretary of Mines Walsh is said to be an active candidate for reappointment by Governor-elect John S. Fisher, who will take office January 18. So far the next governor has not said anything regarding any of his appointments. His attitude toward the conduct of the Department of Mines is not known at Harrisburg.

### Mine Timber Preservation Investigations

In testimony before the House Appropriations Committee, Government Forester W. B. Greeley favored an appropriation of \$5,000 for mine timber preservation investigations. He said there is a great annual loss due to the use of untreated timber in mines. Preservative treatment of the timbers would prolong the life of mine timbers and aid in preventing accidents by fall of timbering in mines.

"The mining industry is prepared to take hold of this in a serious way," he

### IMPORTANCE OF AMPLE STEEL REINFORCEMENT IN CONCRETE MINE STOPPINGS

Reinforced concrete mine stoppings, which are employed to prevent explosions penetrating from one portion of a mine to another, should have the steel reinforcement carried well into the grooves cut in the sides, top, and bottom of the mine opening, if the barrier is to resist explosion pressures, according to recent tests conducted by the Bureau of Mines and Bureau of Standards. The tests so far completed also appear to warrant the use of slightly higher working stresses in the steel than are usually employed in other types of structures.

The primary reason for conducting these experiments is in connection with the establishment of regulations for the government of coal mining operations on leased public lands of the United States. These regulations specify the use of certain stoppings to resist explosions of a certain strength. As there are no data available on which to base such specifications, these tests were instituted.

The slabs are subjected to explosive charges of black powder in a specially designed chamber. Both plain concrete slabs and slabs reinforced with steel in varying amounts and in various shapes are being tested. The slabs are 5 feet square and either 8 or 12 inches thick. The pressures act on a surface 4 feet square.

Although the testing is still in progress, the results so far obtained indicate that the stresses developed

by the explosion are about the same as would be obtained with static pressures of the same intensity.

Tests thus far conducted have yielded the following results:

A slab which had 1 percent reinforcement failed by shearing along the bearing edges at a pressure of about 45 pounds per square inch. In this slab the steel bars did not extend past the supports. Another slab tested had the same amount of steel, but in this case it was carried past the supports. This slab failed by tension in the steel at a pressure of 75 pounds per square inch. No shear cracks were observed. A slab which had 1 percent reinforcement but which had alternate bars bent up to take the shear failed at 47 pounds per square inch by blowing out at the top. The reinforcement in all these slabs was placed only across the width upon which the pressures acted, leaving about 8 inches not reinforced. Although it was not anticipated that pressures would act on these areas, this is what happened in the case of the last-named slab. It is perhaps fortunate that the slab failed in this way, because it shows the importance of carrying the steel well into the grooves cut in the sides, top, and bottom of the mine opening. A slab of the same type as the previous one, but with only half the reinforcement failed by tension in the steel, at a pressure of 50 pounds per square inch.

said. The Forest Service plans to test preservatives other than creosote.

Representative Buchanan (Dem., Tex.), in stating that railroads and the trade generally had adopted creosote for timber preservation, asked why the mining industry had not adopted it.

Forester Greeley said he did not know, and added: "The mining industry is very far behind railroad, telegraph, and telephone companies in the use of preservative methods of treating timber. It is the result of slowness to appreciate the problem and perhaps the old-time rule of thumb conditions that have governed the mining industry. A number of the more progressive mines are doing differently. We desire to get the whole industry interested in a broad way in working out and applying timber preservation in mining operations."

"If the mining industry would not adopt the creosote system which is

established and well known, what reason have you to expect it would adopt any other system?" asked Representative Buchanan.

Mr. Greeley said the Forest Service desired to get the mining industry to cooperate with it on a series of tests in the mines underground on timbers treated with creosote, zinc chloride, and Wolman salts to determine the possible savings.

"It looks like the mining industry needs education on processes of preserving timber," said Representative Buchanan.

"I think it does," said Mr. Greeley.

### Safety First Contest

The Rosiclare Lead and Fluorspar Mining Co., at Rosiclare, Ill., staged a mine safety contest among its employees. Four teams participated, the winners having a percentage of 99 and the low-

est team 95.6. The prize was an engraved silver cup, the winning of which three successive years will give permanent possession.

#### JAMES H. MCGRAW HONORED

An unusual tribute to the ideals and accomplishment of a man was given on December 17 in the form of a testimonial dinner to James H. McGraw, president of the McGraw-Hill Publishing Company. The occasion was Mr. McGraw's sixty-sixth birthday. Among those extending their felicitations and in attendance were Secretary of Commerce Hoover, Secretary of War Davis, Thomas A. Edison, John Hays Hammond, Rembrandt Feale, S. D. Warriner, George Otis Smith, Gerard Swope, Owen D. Young, Willits H. Sawyer, General Guy E. Tripp, Dexter S. Kimball, Charles L. Edgar and John W. Lieb.

At the dinner, it was recounted how Mr. McGraw, a country school teacher, came to New York as a young man, inspired by his vision of the future of the business and engineering press, to build up the present great publishing house. Building on "the qualities of an ardent spirit of service of faith, vision, courage and perseverance," Mr. McGraw has had a wide and constructively helpful influence upon the industries of the country.

#### Uses of Fluorspar

Fluorspar, or fluorite, is a nonmetallic crystalline mineral that usually occurs in glassy transparent cubes or cleavable masses, states the Bureau of Mines, in a recent report. Less commonly it is granular or fibrous in structure, and occasionally is banded. Fluorspar has a specific gravity of 3.2, is brittle, has a hardness of 4, and can easily be scratched with a knife. Chemically it consists of calcium and fluorine in the proportion of 51.1 to 48.9. In color fluorspar ranges, according to purity, from a clear colorless, or slightly bluish, glass-like substance through various brilliant hues, of which purple and green are most common; much of it is white and opaque.

The market for the bulk of fluorspar sold in the United States depends on the condition of the steel industry, and the demand fluctuates with the rise and fall in the production of basic open-hearth steel. From 80 to 85 per cent of the fluorspar produced in the United States is used as a flux in basic open-hearth steel furnaces. Steel makers require that such fluorspar be in pieces not larger than three-quarters inch and that it show an analysis at least 80 per cent (preferably more) calcium fluoride and not more than 6 per cent silica. This flux is used chiefly for giving fluidity to slags, but it also facilitates the pas-

sage of impurities such as sulphur and phosphorus into the slag.

Fluorspar also finds use as a flux in some blast-furnace operations and in iron and brass furnaces; in the smelting of gold, silver, and copper ores; in the refining of copper, antimony, and lead; in carbon electrodes; and in the manufacture of sodium fluoride, used as a wood preservative and insecticide.

Detailed information regarding the fluorspar situation is contained in the Bureau of Mines report on "Fluorspar and Cryolite in 1925," by Hubert W. Davis, which may be obtained from the Superintendent of Documents, Washington, D. C., at a price of 5 cents.

#### Four-Fifths of World's Asbestos Consumed in the United States

Asbestos takes its place as another widely used product in American industry for the supply of which we are dependent on foreign sources, according to a report compiled in the Minerals Division of the Department of Commerce. Only about one-third of 1 per cent of the world's asbestos, the report states, is produced in the United States, while at the same time the annual consumption in this country is more than four-fifths of the world's production.

During the five-year period of 1920-1924, the report points out, the average annual world production of asbestos amounted to 187,245 short tons. During this same period the average annual consumption in this country was 161,225 tons. Last year the entire world produced 330,892 tons; the United States produced a little more than 1,000 tons and imported 205,821 tons.

Canada is the premier asbestos producer, according to the report, with South Africa second. Cyprus, Russia, Italy and China follow in the order named, but their production is small at present compared with Canada. The United States buys more than 70 per cent of the entire Canadian output, last year taking 201,730 tons out of a total production of 273,522. Before the war, it is revealed, the Russian asbestos industry ranked next to the Canadian. The war, however, completely disorganized the industry and the Russian product disappeared from the world's markets. The industry is now being revived and in 1925 produced in the neighborhood of 10,000 tons, about half of the pre-war production.

The value of U. S. imports of asbestos in 1925 was more than \$7,000,000. Exports of manufactured asbestos, with the exception of roofing, during this period totaled \$2,407,000.

The increasing importance of asbestos to modern engineering and mechanical practice, the report points out, as well as to the efficient construction of buildings wherever heat insulation and fire protec-

tion are involved, mark asbestos as an important index of progressive efficiency in the conservation of energy and elimination of waste in the national economy.

#### THE ANTHRACITE SITUATION

(Continued from page 32)

1924, or over 250,000 tons a week. This tonnage has moved quite freely from the mines to the dealers and from the dealers' yards to the bins of consumers, and the quantity of anthracite in the storage yards of the producers on October 1 of this year was considerably less than it usually is at the beginning of the fall season. Notwithstanding the absence of any production during the first month and a half of the year, the indications are that the total production for 1926 will be equal to that of any recent normal year.

The more distant markets of New England, Canada, and the northwest, to which shipments must be made during the warmer months (and this particularly refers to the Northwest, to which most of the coal is shipped by water while navigation is open) have been well taken care of. The exports to Canada which were practically nil in the first two months of this year have in total to September 30 amounted to 2,454,315 gross tons, against 2,686,008 gross tons in 1925, and 2,665,963 tons in 1924. The shipments to New England this year are nearly 100,000 tons more than they were in 1924, being 6,327,000 tons against 6,235,000 tons, which is not so bad considering that in January and February of this year hens' teeth were plentiful compared to cars of anthracite on New England railroad tracks, and the great inroads that oil and bituminous coal (smokeless, of course) are said to have made in the anthracite markets of New England. In 1925 anthracite shipments into New England up to the end of October were 5,625,000 gross tons. The Lake shipments to the end of October this year have amounted to 2,244,289 gross tons, nearly 600,000 tons more than they were in 1925 for the same period, but about 300,000 tons less than in 1924.

Someone will probably ask what effect the use of oil has had upon the domestic anthracite trade? It has had some. It is estimated that possibly 5,000,000 tons of anthracite have been displaced by the use of oil for domestic purposes, but we do not look upon it as a permanent menace to the industry, the most encouraging indication of this being that from reports coming to us it appears that about as many oil-burning equipments are being taken out each year as new ones are being installed, and, then, a recent report of the Government's Oil Conservation Board does not give encouragement to the idea of a prolonged supply and use of liquid fuel.





## WITH THE MANUFACTURERS



### New Rotating Cam Limit Switch

The Electric Controller & Manufacturing Co., of Cleveland, Ohio, announce a new Rotating Cam Limit Switch to be used with magnetic controllers for the automatic control of machines having such fixed sequence of operation as slowing down, stopping and reversing.

This Cam Type Limit Switch is totally inclosed, is equipped with tapered roller bearings, and is designed to carry up to six sets of contacts. The cams which operate the opening and closing of the contacts are each adjusted independently of the others and can be fixed at an infinite number of positions, thus giving extreme flexibility to the machine with which it is used.

This company also announces the appointment of Farr Electric Service, Inc., 228 West South Temple, Salt Lake City, Utah, as their representatives; also the removal of their Toronto office from The Traders' Bank Building to 415 Metropolitan Building, Toronto, Ontario.

### How to Splice Wire Rope

In order to prevent appreciable loss of strength at the splice, it is customary, according to the American Cable Co., to make the splice not less in length than that given in the table below for ropes of different sizes:

Length of Rope	Length of Splice
$\frac{1}{2}$ -inch .....	15 feet
$\frac{3}{8}$ -inch .....	20 feet
$\frac{5}{8}$ -inch .....	24 feet
$\frac{7}{8}$ -inch .....	28 feet
1 -inch .....	32 feet
$1\frac{1}{8}$ -inch .....	36 feet
$1\frac{1}{4}$ -inch .....	40 feet
$1\frac{1}{2}$ -inch .....	45 feet

In splicing the two ropes, fasten the ends so that they overlap, allowing for a splice of from 15 to 45 feet, as indicated by the above table. For purposes of explanation we will assume a 30-foot splice. First wrap or tie the ropes securely with iron wire 30 feet from each end, then unlay all strands 15 feet, cutting away the hemp core to permit bringing the two unstranded ends together so that the strands will interlock.

### Relay Axle in New Home

E. W. Bassick and W. R. Bassick, both of Bridgeport, Conn.; E. S. Evans, Detroit; and M. H. Furlaud, New York, have been engaged for several years in the development of a new type of final drive for motor trucks and busses, which is known to the trade as the Relay Axle Drive.

E. W. Bassick and W. R. Bassick were formerly president and vice president of the Bassick Manufacturing Co., manufacturers of the Alemite Lubricating System. E. S. Evans is a well-known manufacturer of automobile loading devices. M. H. Furlaud is a banker of New York and Paris.

During the past year, trucks equipped with the Relay Axle have been put into commercial use in all classes of service with the most satisfactory results. These trucks have demonstrated their ability and economy under the most trying conditions. The records made by these vehicles is responsible for wider expansion just announced.

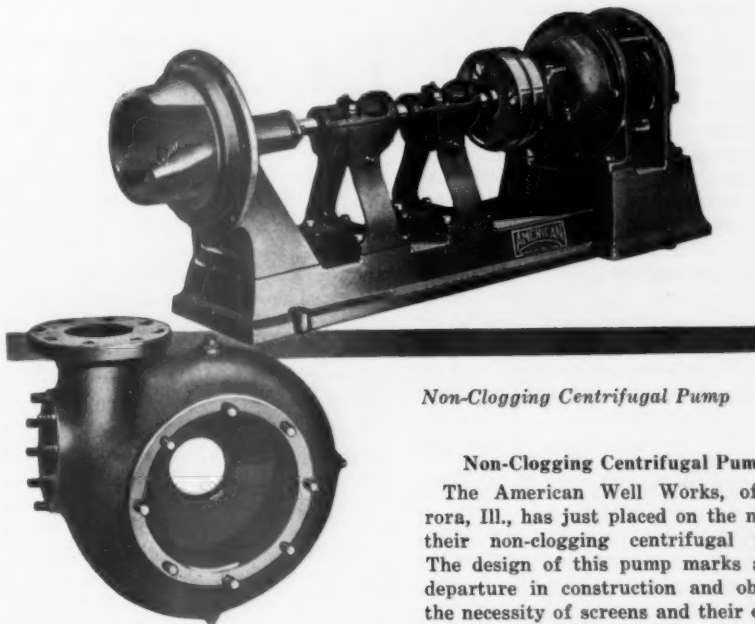
To take care of the expanding business and to further carry on the development of the Relay Axle equipped truck, E. W. Bassick and associates have acquired the capital stock of Service Motors, Incorporated. The Service plant at Wabash, Ind., is one of the finest truck plants in the country. It is of the most modern type of construction, designed and built for the efficient production of motor vehicles. The plant has a floor

to form a new corporation, with headquarters at Wabash, amalgamating the two businesses. The officers and directors of the new corporation will be announced at an early date.

Service Motors, Incorporated, have been successfully manufacturing trucks over a period of years. G. L. Gillam, president of Service Motors, Incorporated, will be an officer of the new corporation and have active charge of the operation of the business.

W. R. Bassick, president of the Commerce Motor Truck Co., will be an officer and director of the new corporation and will be actively interested in the new business. M. A. Holmes, who for a number of years was sales manager of the Republic Truck Co., now sales manager of the Commerce Truck Co., will be in charge of sales for the new corporation.

The men directing all plant and sales operations have long experience in the automotive industry. It is stated that the present field and distributor organization will remain intact, and an aggressive merchandising program will be launched immediately.



Non-Clogging Centrifugal Pump

### Non-Clogging Centrifugal Pump

The American Well Works, of Aurora, Ill., has just placed on the market their non-clogging centrifugal pump. The design of this pump marks a new departure in construction and obviates the necessity of screens and their expensive maintenance.

The single blade impeller in the pump is so designed that the stream lines are not separated, but so the stream of fluid is kept in one mass and carried through the pump without being subdivided. By compelling all the liquid and debris to be discharged through a single peri-

space of approximately 250,000 square feet, giving a capacity of 10,000 to 12,000 trucks per year.

For the past several years the Relay Axle has been manufactured by and in the plant of the Commerce Motor Truck Co., of Ypsilanti, Mich. It is planned



Third Annual Dinner of the Smoke Eaters Association

The third annual dinner and business meeting of the Smoke Eaters' Association was held Tuesday evening, December 7 at the plant of the Mine Safety Appliances Co., Braddock Avenue and Thomas Boulevard, Pittsburgh, Pa., one day in advance of the fortieth convention of the Coal Mining Institute of America.

Membership in the Smoke Eaters' Association is limited to persons who have worn gas masks or Oxygen Breathing Apparatus in connection with underground fire fighting and mine rescue

work. The officers of the association are: President, F. B. Dunbar, of the Hillman Coal & Coke Co., Pittsburgh, Pa.; Vice-President, D. J. Parker, of the United States Bureau of Mines, Pittsburgh, Pa.; and Secretary-Treasurer, C. O. Roberts, of the Vesta Coal Co., California, Pa.

Following the dinner, interesting addresses were made by Messrs. D. J. Parker, J. J. Forbes, and G. S. McCaa, of the United States Bureau of Mines, Pittsburgh.

#### A. W. Scarratt Joins Hyatt

Al W. Scarratt has been appointed assistant chief engineer of the Hyatt Roller Bearing Co., Newark, N. J. He is well known in engineering circles because of his long association with tractor and power farm implement development, and former activities in electric railway and power-house engineering fields.

Prior to joining the Hyatt organization, Mr. Scarratt spent 13½ years with Minneapolis Steel & Machinery Co., Minneapolis. Besides his work on tractors, engines, and other farm equipment, he developed the "Twin City" line of motor trucks, the "Twin City" bus, and a new type of mechanical drive gas rail car having four live axles and eight driving wheels.

He was one of the organizers of the Society of Tractor Engineers in Minneapolis, and a prime mover in merging that organization with the Society of Automotive Engineers. He has served as councilor, vice president of Tractor Engineering, and as secretary of the Minneapolis section of the S. A. E., which office he still holds, and has also served on various standards committees of the society.

For eight years, prior to his association with the steel company, Mr. Scarratt served the Twin City Rapid Transit Co.—five years in the mechanical department and three in power house and electrical development work.

Because of the wide range of anti-friction bearing applications, and Mr. Scarratt's experience, he is a valuable addition to the Hyatt engineering staff. He assumed his new duties October 1, with headquarters at the Hyatt plant, Newark, N. J.

#### Nickel Steel Data and Applications

A series of 8½" x 11" technical bulletins are being distributed by the International Nickel Co., 67 Wall Street, New York, N. Y. The following nine bulletins have been issued to date:

*Bulletin No. 1*—"Society of Automotive Engineers' Standard Specifications for Steels." From the report of the Iron and Steel Division. 4 pages. A description of the S. A. E. system of specifications for chemical compositions, chemical properties, finish, inspection and rejection for the various standard rolled and cast steels.

*Bulletin No. 2*—"Physical and Mechanical Properties of Nickel Steels." From Bureau of Standards Circular No. 100—"Nickel and Its Alloys." 8 pages. A brief summary of the principal effects of the addition of nickel to steel with notes on tensile properties and applications of the forging and structural grades of nickel and nickel chromium steels. Tensile, magnetic and electrical properties of high nickel steels, or ferro-nickel alloys, with data on their thermal expansivity are also given.

*Bulletin No. 3*—"Heat Treatment and Applications of Nickel and Nickel Chromium Steels." From Handbook of American Society for Steel Treating. 12 pages. Details of the heat treatment of the standard nickel and nickel chromium steel, with notes on the properties developed and their more important industrial applications.

*Bulletin No. 4*—"Making Steel Castings Stronger." 8 pages. An analysis of the effects produced by the addition of nickel chromium and other alloying elements to steel castings with instructions for making the additions and data on cost, heat treatment and commercial applications.

*Bulletin No. 5*—"The Mill Inspection of Steel." 8 pages. A description, in elemental detail, of the processes of manufacture of rolled steel, from raw material to final inspection, with details on the inspection at each stage and definitions and descriptions of common defects.

*Bulletin No. 6*—"Alloy Steel Reduces Die Block Costs." 4 pages. Comparative costs of producing commercial forgings with carbon steel and nickel chromium steel die blocks with tabulation of savings effected and advantages derived by the use of the alloy. Figures submitted are based on production records of a large job forging plant producing principally automotive castings.

pheral passage, there is avoided the possibility of different portions of a single piece of debris being swept into different outlet passages and thereby being hung up within the impeller. This precludes screening sewage or fluid containing other material before pumping.

Fluids containing stringy matter, mineral matter, animal matter, and vegetable matter such as hair, string, waste, shavings, rags, mud, chips, sand, sludge, wire, debris, slaughter house and fish market refuse, offal, fat, grease, weeds, straw, stable flushings, etc., can be handled successfully.

This pump is made in both vertical and horizontal types and is adapted for municipal sewage and general industrial use. Engineering information may be obtained from the engineering department of this company.

#### Personnel Changes, Timken Roller Bearing Co.

Effective December 1, Mr. Paul Ackerman was appointed engineer, Service Department, of the Timken Roller Bearing Co. All service work of the automotive, industrial and steel mill divisions will be coordinated under his direction. Headquarters will be maintained at Canton, Ohio. Mr. J. H. Ridge has been appointed branch manager of the Pittsburgh branch of the Timken Roller Bearing Service & Sales Co. Mr. G. G. Weston has been appointed branch manager of the Omaha branch of the Timken Roller Bearing Service & Sales Co.

**Bulletin No. 7—"Automobile Design and Automotive Steels."** 12 pages. An analysis of the factors influencing the design of the modern motor car and the selection of suitable steels to be used in its construction, with typical calculations illustrating the methods used to determine stresses and factors of safety in various automotive parts.

**Bulletin No. 8—"Improving Gray Cast Iron with Nickel."** 12 pages. A brief presentation of all essential information required by the foundryman, metallurgist or engineer, with tables, illustrations, commercial applications and instructions for making the nickel addition.

**Bulletin No. 9—"Physical Properties of Nickel and Nickel Chromium Steel."** 16 pages. A compilation of curves showing the average values of tensile strength, elastic limit, reduction of area, elongation and Brinell hardness, at various drawing temperatures for the S. A. E. standard nickel and nickel chromium steels. Tables of the maximum and minimum values of these same properties reported by various authorities are also given, together with causes of variations and notes on the use of the data in design.

Loose-leaf type binders to facilitate filing and increase the reference value of these bulletins are also available and will be gladly furnished on request.

#### New Conway Tunnel Shovel Bulletin

The St. Louis Power Shovel Co., 322 Chemical Building, St. Louis, Mo., has just completed a bulletin covering their improved All-Steel Conway Shovel as applied to tunnel and mining work.

The application of Conway Shovels to hydroelectric, irrigation, city water supply and railroad tunneling has been very extensive. This bulletin contains a number of illustrations from recent high-speed rock tunnel jobs, which, together with sketches of car-switching facilities and other operating data, will make interesting reading for anyone interested in tunneling operations.

A copy of this tunnel bulletin will be sent to those interested by addressing a request to the St. Louis Power Shovel Co. at their St. Louis office.

#### Data On Pump Application

Goulds Pumps, Inc., has recently compiled a set of Lefax-Goulds data sheets giving information on pump applications. Among these will be found the specifications recommended by the Standardization Division of The American Mining Congress on Mine Pumps.

#### Sullivan Office at Butte Changes

The Butte, Mont., office of the Sullivan Machinery Co., James G. Graham, manager, has been moved from 48 East Broadway to 54 East Broadway.

#### Approved Gas-proof Junction Box Now Available

There has long been a need for an approved gas-proof fused junction or switch box for use in gaseous mines. In fact, there are mine laws calling for such a device, but they have not been enforced because of the lack of an acceptable construction.

Mining operators and manufacturers of mining machines will therefore be interested in the announcement of the Ohio Brass Company of a new and approved direct current fused junction box, bearing the approval plate of the U. S. Bureau of Mines.

This device provides fuse protection and disconnecting switch for loading machines, cutting machines, conveyors, hoists and other similar motor driven mining machines. Such machines, especially those carrying the approval

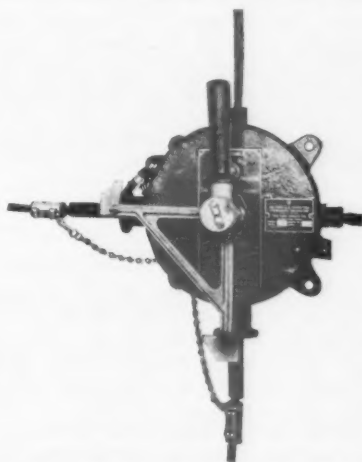


plate and coming within the permissible class, can now have acceptable protection.

The junction box may be used as a permanent switch installed in a room to give protection for each machine or there might be several of the boxes conveniently located for one machine that may be working a number of rooms. Another scheme would be its use installed on the machine itself.

The device is a double-pole, double-break, gas-proof switch, with two fuses, so interlocked that the plug contacts on the motor side can not be inserted or removed while the switch is in the "on" position. It is also interlocked so that the cover can not be removed nor can a fuse be inserted while there is current on the fuses.

The switch will break the circuit under load if emergency requires or if done by accident. It has a quick-break feature and the arc is interrupted at four points.

The cover is screwed on so that no gasket is required. This cover must be screwed clear down to the stop before the device becomes operative.

Making or breaking the circuit, or blowing of a fuse, takes place inside the gas-proof malleable iron case. The inside is thoroughly lined with Dirigo molded insulation and transite and ebonite asbestos wood.

Trico powder packed, enclosed links only in 200 amp., 250 volt or 100 amp., 600 volt sizes are used in this junction box.

#### New Catalogue On Power Transmission

A new catalogue, full of power transmission and engineering information, has just been issued by the Hill Clutch Machine & Foundry Co., of Cleveland, Ohio. This catalogue, No. 26, is printed in three sections, A, B and C.

Section 26A illustrates and describes a new Flexible Coupling of unique simplicity, flanged and compression coupling, shafting and bearings. A large part of this section is devoted to the illustration and description of the remarkably efficient "Cleveland Type" Oil Film Bearing, in which the rotating shaft or journal is supported without metallic contact, on a nearly frictionless film of oil. Complete data is given on a heavy duty form of this bearing, in which bearing temperatures, due either to external heat or high speed and heavy pressures, are controlled by cooling the lubricating oil with a circulating water cooling system. Another item in this section is an improved type of clamp for securing bearings to structural steel without the necessity of drilling holes.

Section 26-B covers fully the application of the patented "Smith Type" Hill Clutch Pulleys and Cut-off Couplings, including quill drives. A complete horsepower table is presented from which friction clutch or plain pulleys may be chosen to meet any requirements. Full data and dimension tables enable the designer to incorporate any of the standard forms of "Smith Type" Hill Clutches in power transmission layouts. Following pages take up transmission of power by belting, giving formulas and tables covering the horsepower of leather belting. Applications of belt tighteners to secure maximum horsepower transmitted is discussed in detail. The application of the new "Steelarm" Automatic Belt Tightener, which provides means of scientifically controlling belt slip, will be of interest to engineers and power transmission men in many industries.

Section 26-C illustrates and describes both American and English Systems of rope drives; agitator designs, parts and gearing; "Forged-Cast," iron cast tooth, and cut spur and bevel gears; "Industrial Type" Speed Transformers, and a wealth of pertinent engineering data such as bolt strengths and dimensions, pipe dimensions, threads and tap drills, sheet and wire gauges, fusion temperatures, tables of allowable loads on struc-



tural shapes, concrete data, trigonometric functions, areas and circumferences of circles, etc.

The various industries using agitators will find the standardized agitator parts very helpful in laying out and building up agitator units at small expense. For agitator and other slow speed machine drives, the "Industrial Type" Speed Transformer provides an ideal means of obtaining the required low speed direct from a high speed motor. This speed transformer consists of an oil tight cast iron housing enclosing a train of spur gears. All gears have 20 degree involute generated teeth. Pinions are hardened. Mating gears are "Forged-Cast." Automatic flood lubrication of the nicely fitted bronze bearings eliminates friction and maintenance. Every gear or pinion is supported between two bearings.

The "Forged-Cast" Gears are used in the "Industrial Type" Speed Transformers represent the latest development in gear manufacture. The teeth of these gears are generated in a solid forged and machined steel ring, into which has been previously cast, by a special process, an iron hub and web or arms. The union of iron hub and steel rim is a laminated weld, and the finished gear is one integral piece. Since the teeth are cut in solid forged steel, 100 percent tooth strength is assured. These gears are available for general mill and machine reduction gearing. The portion of Section C covering gearing illustrates actual tooth sizes for usual pitches and gives gear horsepower in tabulated form, calculated from Lewis formulae.

The three sections of catalogue No. 26 have a total of 258 pages, and are substantially bound. Each section is profusely illustrated and line drawings of individual products furnish controlling dimensions of all sizes.

Engineers, master mechanics, plant superintendents and purchasing agents will find this new catalogue a power transmission text book in three convenient volumes.

## ZINC MINING INDUSTRY

(Continued from page 24)

and all other costs, was absorbed by the broker. The Tri-State miner did not receive the benefit of the demand, nor did his product make the friends in Europe to which its high quality and ease of smelting entitles it. Meanwhile, with the great increase in Mexican production and smaller increases elsewhere, and more lately the piling up of Australian concentrates and their diversion to continental Europe during the British coal strike, the shortage of ore supplies has abated. New contracts for ore are now being made in lower price formulas, and there does not seem to be any immediate prospect of

profitable export business for Tri-State ores.

The smelting of zinc ores and production of metal is at present mainly confined to North America and Europe, which produce 95 percent of the world's total, the remaining 5 percent being produced in Australia and Japan. New smelting processes are being discussed and investigation made into possibilities of smelting plants closer to the sources of ore, but no radical changes have yet taken definite form. Ore supplies, as we have seen, are at present ample. In consumption of zinc, again we find that North America and Europe account for nearly 95 percent of the world's total. In the United States consumption has recently been at a rate equal to one and three-fourths times the 1913 level, and equal to more than 40 percent of the world's total. European consumption has not had a normal increase, and in fact consumption is still below the 1913 level. Possibilities of increasing consumption are good, both through advertising and popularizing its use in this country and through revival of prosperity in Europe, and from a long range viewpoint the future of zinc would appear eminently satisfactory.

## ARIZONA CHAPTER, A. M. C., ANNUAL MEETING

The annual meeting of the Arizona Chapter of the American Mining Congress was held December 13, 1926, at the Adams Hotel, Phoenix, Ariz., with Governor F. W. McLennen presiding. This was a business meeting and was confined to the reports of committees and the discussion of the activities of the chapter. Officers elected for 1927 were: Governor, F. W. McLennen; Vice-Governors, W. S. Boyd and H. A. Clark; Secretary, W. B. Gohring. Directors elected to serve during 1927 are as follows: F. A. Woodward, Iron Cap Copper Co.; Robt. E. Tally, United Verde Copper Co.; C. A. Smith, Nevada Cons. Copper Co., Ray Branch; W. V. DeCamp, United Verde Copper Co.; H. A. Clark, United Verde Copper Co.; G. M. Colvocoresses, Southwest Metals Co.; Michael Curley, New Cornelia Copper Co.; J. P. Hodgson, Morenci Branch, Phelps Dodge Corp.; Wm. Koerner, Magma Copper Co.; Julius Kruttschnitt, American Smelting & Refining Co.; F. W. McLennen, Miami Copper Co.; W. G. McBride, Old Dominion Co.; T. O. McGrath, Shattuck Denn Mining Co.; T. H. O'Brien, Inspiration Cons. Copper Co.; P. G. Beckett, Phelps Dodge Corp.; W. S. Boyd, Nevada Cons. Copper Co., Ray Branch.

Upon the invitation of Robt. E. Tally, it was decided to hold the spring meeting of the Arizona Chapter at Jerome.

## LEGISLATIVE REVIEW

(Continued from page 49)

(Rep., Nebr.). It proposes the acquisition by the Government of the Cape Cod Canal.

### NICARAGUAN CANAL

H. R. 15346. Introduced by Mr. O'Connor (Dem., La.). Referred to the Committee on Interstate Commerce. This bill proposes to create a commission of four civilians and one Army engineer to report in December, 1928, as to the wisdom of constructing the Nicaraguan Canal. The commission is authorized in its investigations to call on the services of the Geological Survey.

H. R. 15349. Introduced by Mr. Swing (Rep., Calif.). Referred to the Committee on Irrigation. This bill provides for power development on the Colorado River.

### TRANSPORTATION MEASURES

S. 4892. Introduced by Mr. Fess (Rep., Ohio). Referred to the Committee on Interstate Commerce. This bill provides for the consolidation of railroads.

S. 4842. Introduced by Mr. Hawes (Dem., Mo.) Referred to the Committee on Interstate Commerce. This bill proposes to create seven regional commissions to aid the Interstate Commerce Commission. The headquarters of these regional bodies would be located as follows:

New England Division, Boston; Eastern Division, New York; Southeastern Division, Atlanta; Central Division, Cleveland; Western Division, Chicago; Southwestern Division, St. Louis; Pacific Division, San Francisco. Each regional commission would consist of three members.

H. R. 14837. Introduced by Mr. Smith (Rep., Idaho). Referred to the Committee on Judiciary. This bill authorizes Newton W. Gilbert, D. Ross Wynn, and William H. Lindsey to incorporate the World Commerce Corporation, with authority to produce or otherwise acquire petroleum and other raw materials in foreign countries for industries in the United States.

S. 4845. Introduced by Mr. Smoot (Rep., Utah). Referred to the Committee on Interstate Commerce. This bill provides penalties for the manufacture, sale, or transportation of misbranded, misrepresented, or falsely described articles, covering wares and merchandise of every description. The law would be administered by the Secretaries of Commerce, Treasury, and Agriculture.

S. 4601. Introduced by Mr. Gooding (Rep., Idaho). Referred to the Committee on Interstate Commerce. This bill proposes to repeal section 15a of the interstate commerce act, known as the 5½ percent earning guarantee to railroads.

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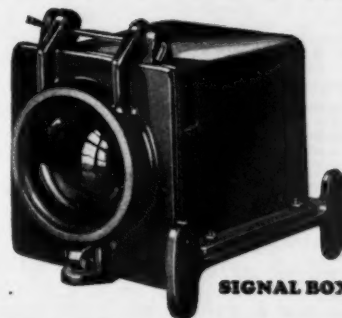
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 Ingersoll-Rand Co., 11 Broadway, New York City.

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The Jeffrey Mfg. Company, 958-99 North 4th St., Columbus, Ohio.  
 Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.  
 Roberts & Schaefer Co., Chicago, Ill.

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**COOLERS, ROTARY**

Vulcan Iron Works, Wilkes-Barre, Pa.

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 Hoffman Bros., Punxsutawney, Pa.  
 Mott Core Drilling Co., Huntington, W. Va.

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Fawcett Machine Co., Pittsburgh, Pa.

**COUPLINGS, ROCK DRILL**

Knox Mfg. Co., Philadelphia, Pa.

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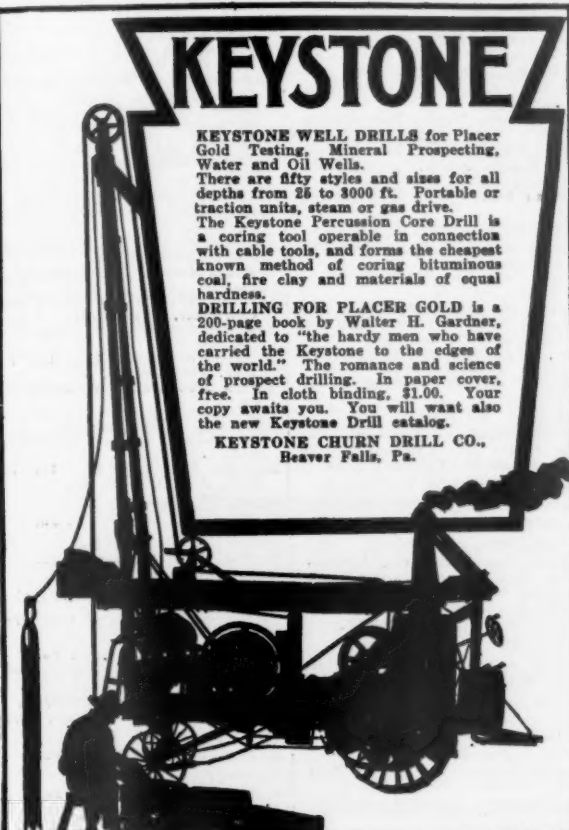
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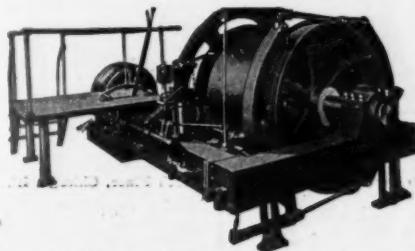
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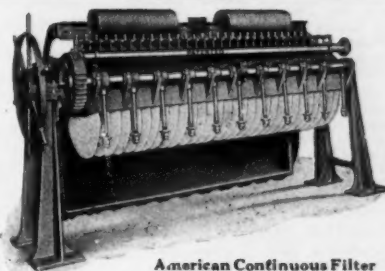
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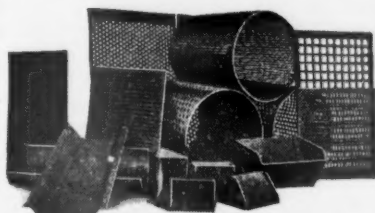
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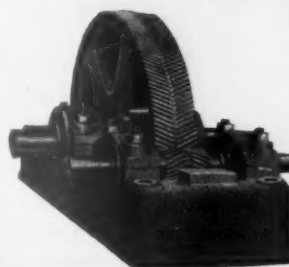
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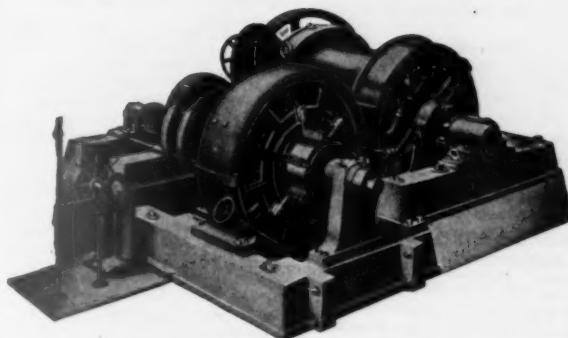
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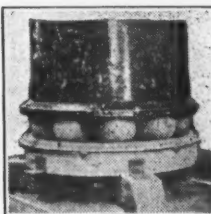
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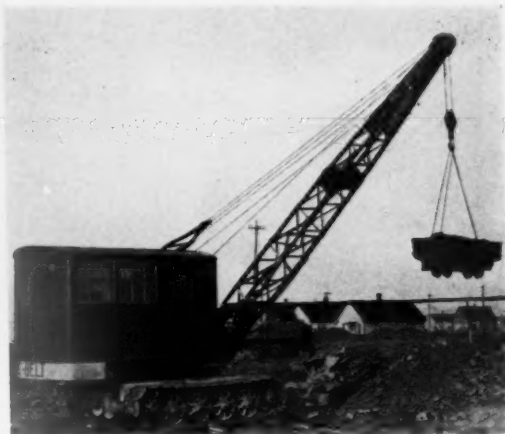
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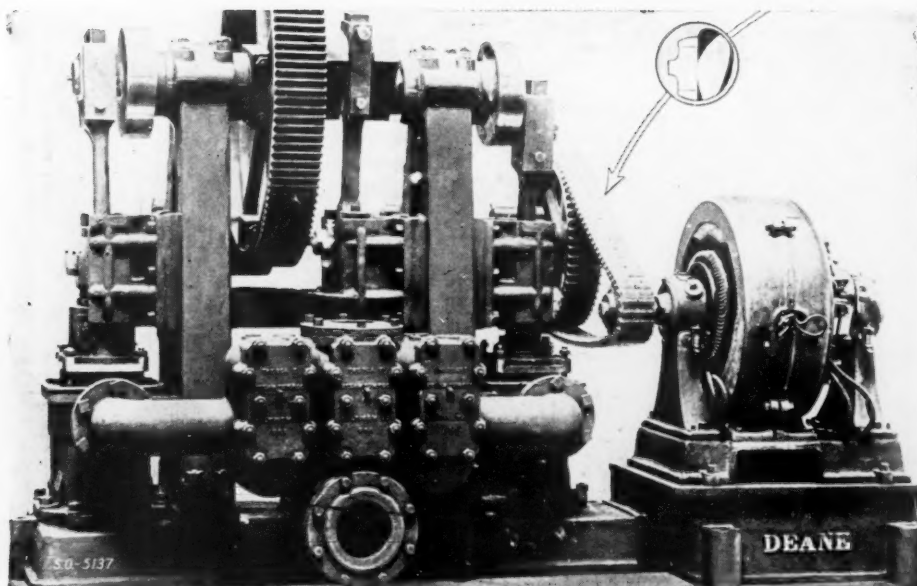
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